



THE IMPERIAL ENCYCLOPEDIA AND DICTIONARY

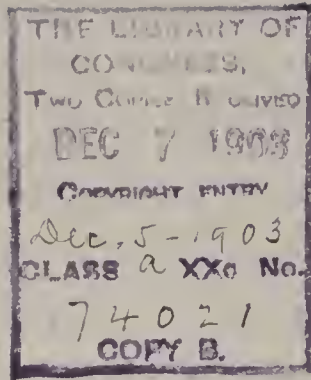
A LIBRARY OF UNIVERSAL
KNOWLEDGE AND AN UN-
ABRIDGED DICTIONARY OF
THE ENGLISH LANGUAGE
UNDER ONE ALPHABET

IN FORTY VOLUMES

VOLUME 24
MERCURY—MOODY

NEW YORK HENRY G. ALLEN & COMPANY

AE5
.I34



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BY

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SCHEME OF SOUND SYMBOLS

FOR THE PRONUNCIATION OF WORDS.

Note.—(·) is the mark dividing words respelt phonetically into syllables: (') the accent indicating on which syllable or syllables the accent or stress of the voice is to be placed.

Sound-symbols employed in Respelling.	Representing the Sounds as exemplified in the Words.	Words respelt with Sound-symbols and Marks for Pronunciation.
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ā	mate, fate, fail, aye	māt, fāt, fāl, ā.
ă	mat, fat	măt, făt.
â	far, calm, father	fâr, kâm, fâ'thēr.
ä	care, fair	câr, fâr.
aw	fall, laud, law	fawl, lawd, law.
ē	mete, meat, feet, free	mēt, mēt, fēt, frē.
ě	met, bed	mět, běd.
é	her, stir, heard, cur	hēr, stēr, hērd, kēr.
î	pine, ply, height	pīn, plī, hīt.
ĩ	pin, nymph, ability	pĭn, nĭmf, ä-bĭl'ĩ-tĭ.
ō	note, toll, soul	nōt, tōl, sōl.
ö	not, plot	nöt, plöt.
ó	move, smooth	môv, smôth.
ö	Goe'the (similar to e in her)	gö'teh.
ow	noun, bough, cow	nowñ. bow, kow.
oy	boy, boil	boy, boyl.
û	pure, dew, few	pŭr, dŭ, fŭ.
ũ	bud, come, tough	bŭd, kŭm, tŭf.
ú	full, push, good	fúl, pŭsh, gŭd.
ü	French plume, Scotch guid	plüm, gŭd.
ch	chair, match	chär, mäch.
ch	German buch, Heidelberg,	
	Scotch loch (guttural)	böch, hĭ'del-bērĕh, löĕh.
g	game, go, gun	gām, gō, gŭn.
j	judge, gem, gin	jŭj, jēm, jĭn.
k	king, cat, cot, cut	kĭng, kăt, kôt, kŭt.
s	sit, scene, cell, city, cypress	sĭt, sĕn, sĕl, sĭt'ĭ, sĭ'prĕs.
sh	shun, ambition	shŭn, äm-bĭsh'ŭn.
th	thing, breath	thĭng, brĕth.
th	though, breathe	thō, brĕth.
z	zeal, maze, muse	zĕl, māz, mŭz.
zh	azure, vision	äzh'ēr, vĭzh'ŭn.

ABBREVIATIONS USED IN THIS WORK.

a., or adj......adjective
A.B......Bachelor of Arts
abbr......abbreviation, abbreviated
abl. or abla.ablative
Abp......Archbishop
abt......about
Acad......Academy
acc. or ac.accusative
accom......accommodated, accommodation
act......active
A.D......in the year of our Lord [*Anno Domini*]
Adj......Adjutant
Adm......Admiral
adv. or ad.adverb
A. F......Anglo-French
Ag......Silver [*Argentum*]
agri......agriculture
A. L......Anglo-Latin
Al......Aluminium
Ala......Alabama
Alb......Albanian
alg......algebra
A.M......before noon [*ante meridiem*]
A.M......Master of Arts
Am......Ainos
Amer......America, -n
anat......anatomy, anatomical
anc......ancient, anciently
AN. M......in the year of the world [*Anno Mundi*]
anon......anonymous
antiq......antiquity, antiquities
aor......aorist, -ic
app......appendix
appar......apparently
Apr......April
Ar......Arabic
arch......architecture
archæol......archæology
arith......arithmetic
Ark......Arkansas
art......article
artil......artillery
AS......Anglo Saxon
As......Arsenic
Assoc......Association
asst......assistant
astrol......astrology
astron......astronomy
attrib......attributive
atty......attorney
at. wt......atomic weight
Au......Gold [*Aurum*]

A.U.C......in the year of the building of the city (Rome) [*Anno Urbis conditæ*]
Aug......August
aug......augmentative
Aust......Austrian
A. V......authorized version [of Bible, 1611]
avoir......avoirdu pois
B......Boron
B......Britannic
b......born
Ba......Barium
Bart......Baronet
Bav......Bavarian
bl.; bbl......barrel; barrels
B.C......before Christ
B.C.L......Bachelor of Civil Law
B.D......Bachelor of Divinity
bef......before
Belg......Belgic
Beng......Bengali
Bi......Bismuth
biog......biography, biographical
biol......biology
B.L......Bachelor of Laws
Bohem......Bohemian
bot......botany, botanical
Bp......Bishop
Br......Bromine
Braz......Brazilian
Bret......Breton
Brig......Brigadier
Brit......British, Britannica
bro......brother
Bulg......Bulgarian
bush......bushel, bushels
C......Carbon
c......century
Ca......Calcium
Cal......California
Camb......Cambridge
Can......Canada
Cant......Canterbury
cap......capital
Capt......Captain
Card......Cardinal
carp......carpentry
Cath......Catholic
caus......causative
cav......cavalry
Cd......Cadmium
Ce......Cerium
Celt......Celtic
cent......central
cf......compare [*confer*]
ch or chh......church

ABBREVIATIONS.

Chal.....	Chaldeæ	diff.....	different, (difference)
chap.....	chapter	dim.....	diminutive
chem.....	chemistry, chemical	dist... ..	district
Chin.....	Chinese	distrib... ..	distributive
Chron.....	Chronicles	div.....	division
chron.....	chronology	doz.....	dozen
Cl.....	Chlorine	Dr.....	Doctor
Class.....	Classical [= Greek and Latin]	dr.....	dram, drams
Co.....	Cobalt	dram.....	dramatic
Co.....	Company	Dut. or D...	Dutch
co.....	county	dwt	pennyweight
cog.....	cognate [with]	dynam or	
Col.....	Colonel	dyn.....	dynamics
Col	Colossians	E.....	Erbium
Coll.....	College	E. or e.....	East, -ern, -ward
colloq.....	colloquial	E. or Eng.....	English
Colo.....	Colorado	Eccl.....	Ecclesiastes
Com.....	Commodore	eccl. or	ecclesiastical [affairs]
com.....	commerce, commercial	eccles.....	
com.....	common	ed	edited, edition, editor
comp.....	compare	e.g.....	for example [ex gratia]
comp	composition, compound	E. Ind. or	East Indies, East Indian
compar....	comparative	E. I.	
conch	conchology	elect.....	electricity
cong.....	congress	Emp.....	Emperor
Congl.....	Congregational	Encyc.....	Encyclopedia
conj	conjunction	Eng. or E.....	English
Conn or Ct.	Connecticut	engin.....	engineering
contr.....	contraction, contracted	entom	entomology
Cop.....	Coptic	env. ext....	envoy extraordinary
Cor.....	Corinthians	ep.....	epistle
Corn.....	Cornish	Eph	Ephesians
corr.....	corresponding	Episc	Episcopal
Cr	Chromium	eq. or =....	equal, equals
crystal....	crystallography	equiv.....	equivalent
Cs	Cæsium	esp.....	especially
ct.....	cent	Est	Esther
Ct. or Conn.	Connecticut	estab.....	established
Cu.....	Copper [<i>Cuprum</i>]	Esthon....	Esthonian
cwt	a hundred weight	etc.....	and others like [et cetera]
Cyc.....	Cyclopedia	Eth	Ethiopic
D.....	Didymium	ethnog....	ethnography
D. or Dut..	Dutch	ethnol....	ethnology
d.....	died	et seq.....	and the following [et sequentia]
d. [l. s. d.].	penny, pence	etym.....	etymology
Dan.....	Daniel	Eur.....	European
Dan.....	Danish	Ex.....	Exodus
dat	dative	exclam	exclamation
dau.....	daughter	Ezek.....	Ezekiel
D. C.....	District of Columbia	Ezr.....	Ezra
D. C. L.....	Doctor of Civil [or Common] Law	F.....	Fluorine
D. D.	Doctor of Divinity	F. or Fahr.	Fahrenheit
Dec.....	December	f. or fem...	feminine
dec.....	declension	F. or Fr....	French
def.....	definite, definition	fa.....	father
deg.....	degree, degrees	Fahr. or F.	Fahrenheit
Del.....	Delaware	far.....	farriery
del.....	delegate, delegates	Fe.....	Iron [<i>Ferrum</i>]
dem.....	democratic	Feb.....	February
dep.....	deputy	fem or f. ..	feminine
dep.....	deponent	fig.....	figure, figuratively
dept.....	department	Fin.....	Finnish
deriv.....	derivation, derivative	F.—L.....	French from Latin
Deut.....	Deuteronomy	Fla.....	Florida
dial.....	dialect, dialectal	Flem.....	Flemish
diam... ..	diameter	for.....	foreign
Dic.....	Dictionary	fort.....	fortification
		Fr. or F....	French
		fr.....	from

ABBREVIATIONS.

freq.....frequentative	ind.....indicative
FrisFrisian	indefindefinite
ft.....foot, feet	Indo-Eur...Indo-European
fut.....future	inf.....infantry
G. or Ger...German	inf or infin.infinite
G.....Glucinium	instr.....instrument, -al
Ga.....Gallium	int.....interest
Ga.....Georgia	intens.....intensive
GaelGaelic	interj. or
GalGalatians	int.....interjection
gal.....gallon	interrog...interrogative pro
galv.....galvanism, galvanic	noun
gard.....gardening	intr. or
gen.....gender	intrans...intransitive
Gen.....General	Io.....Iowa
GenGenesis	Ir.....Iridium
gen.....genitive	Ir.....Irish
Geno.....Genoese	Iran.....Iranian
geoggeography	irrirregular, -ly
geol.....geology	Is.....Isaiah
geom.....geometry	It.....Italian
Ger.....German, Germany	Jan.....January
Goth.....Gothic	Jap.....Japanese
Gov.....Governor	Jas.....James
govt.....government	Jer.....Jeremiah
Gr.....Grand, Great	Jn.....John
Gr.....Greek	Josh.....Joshua
gr.....grain, grains	Jr.....Junior
gramgrammar	JudgJudges
Gr. Brit...Great Britain	K.....Potassium [<i>Kalium</i>]
Gris.....Grisons	K.....Kings [in Bible]
gungunnery	K.....king
H.....Hegira	Kan.....Kansas
H.....Hydrogen	Kt.....Knight
h.....hour, hours	Ky.....Kentucky
Hab.....Habakkuk	L.....Latin
Hag.....Haggai	L.....Lithium
H. B. M....His [or Her] Britan- nic Majesty	l. [l. s. d.], { pound, pounds or £..... } [sterling]
Heb.....Hebrew, Hebrews	La.....Lanthanum
her.....heraldry	La.....Louisiana
herpet.....herpetology	Lam.....Lamentations
Hg.....Mercury [<i>Hydrar- gyrum</i>]	Lang.....Languedoc
hhd.....hogshead, hogsheads	lang...language
Hind.....Hindustani, Hindu, or Hindi	Lap.....Lapland
histhistory, historical	latlatitude
HonHonorable	lb.; llb. or } pound; pounds lbs..... } [weight]
hort.....horticulture	Let.....Lettish
HosHosea	LevLeviticus
Hung.....Hungarian	LG.....Low German
Hydros....Hydrostatics	L.H.D.....Doctor of Polite Lit- erature
IIodine	Lieut.....Lieutenant
I.; Is.....Island; Islands	LimLimousin
Icel.....Icelandic	LinLinnæus, Linnæan
ichth.....ichthyology	litliteral, -ly
Ida.....Idaho	litliterature
i.e.....that is [<i>id est</i>]	Lith.....Lithuanian
Ill.....Illinois	lithog.....lithograph, -y
illusillustration	LL.....Late Latin, Low Latin
impera or	LL.D.....Doctor of Laws
impr.....imperative	long.....longitude
impers.....impersonal	Luth.....Lutheran
impf or imp.imperfect	M.....Middle
impf. p. or	M.....Monsieur
impimperfect participle	m.....mile, miles
improp....improperly	m. or masc.masculine
In.....Indium	M.A.....Master of Arts
ininch, inches	Macc.Maccabees
incept.....inceptive	mach...machinery
IndIndia, Indian	Mag.....Magazine
IndIndiana	

ABBREVIATIONS.

Maj.....	Major	N. A., or	N. Amer.	North America, -n
Mal.....	Malachi	nat.....	natural	
Mal.....	Malay, Malayan	naut.....	nautilcal	
manuf.....	manufacturing, manufacturers	nav.....	navigation, naval af- fairs	
Mar.....	March	Nb.....	Niobium	
masc or m.	masculine	N. C., or		
Mass.....	Massachusetts	N. Car...	North Carolina	
math.....	mathematics, math- ematical	N. D.....	North Dakota	
Matt.....	Matthew	Neb.....	Nebraska	
M.D.....	Doctor of Medicine	neg.....	negative	
MD.....	Middle Dutch	Neh.....	Nehemiah	
Md.....	Maryland	N. Eng....	New England	
ME.....	Middle English, or Old English	neut or n.	neuter	
Me.....	Maine	Nev.....	Nevada	
mech.....	mechanics, mechani- cal	N.Gr.....	New Greek, Modern Greek	
med.....	medicine, medical	N. H.....	New Hampshire	
mem.....	member	NHG.....	New High German [German]	
mensur ..	mensuration	Ni.....	Nickel	
Messrs. or		N. J.....	New Jersey	
MM.....	Gentlemen, Sirs	NL.....	New Latin, Modern Latin	
metal.....	metallurgy	N. Mex....	New Mexico	
metaph....	metaphysics, meta- physical	N. T., or		
meteor....	meteorology	N. Test...	New Testament	
Meth.....	Methodist	N. Y.	New York [State]	
Mex.....	Mexican	nom.....	nomivative	
Mg.....	Magnesium	Norm. F ..	Norman French	
M.Gr.....	Middle Greek	North. E ..	Northern English	
MHG.....	Middle High Ger- man	Norw....	Norwegian, Norse	
Mic.....	Micah	Nov.....	November	
Mich.....	Michigan	Num.....	Numbers	
mid.....	middle [voice]	numis.....	numismatics	
Milan.....	Milanese	O.....	Ohio	
mid. L. or }	Middle Latin, Me-	O.....	Old	
ML.....	{ diaeval Latin	O.....	Oxygen	
milit. or		Obad.....	Obadiah	
mil.....	military [affairs]	obj.....	objective	
min.....	minute, minutes	obs. or †	obsolete	
mineral....	mineralogy	obsoles ..	obsolescent	
Minn.....	Minnesota	O.Bulg....	Old Bulgarian or Old Slavic	
Min. Plen..	Minister Plenipoten- tiary	Oct.....	October	
Miss.....	Mississippi	Odontog...	odontography	
ML. or }	Middle Latin, Me-	OE.....	Old English	
mid. L. ... }	diaeval Latin	OF or		
MLG.....	Middle Low German.	O. Fr....	Old French	
Mlle.....	Mademoiselle	OHG....	Old High German	
Mme.....	Madam	Ont.....	Ontario	
Mn.....	Manganese	opt ..	optics, optical	
Mo.....	Missouri	Or.....	Oregon	
Mo.....	Molybdenum	ord.....	order	
mod.....	modern	ord....	ordnance	
Mont.....	Montana	org.....	organic	
Mr.....	Master [Mister]	orig ..	original, -ly	
Mrs.....	Mistress [Missis]	ornith.....	ornithology	
MS.; MSS..	manuscript; manu- scripts	Os.....	Osmium	
Mt.....	Mount, mountain	OS.	Old Saxon	
mus.....	music	O. T., or		
MUS.DOC...	Doctor of Music	O. Test...	Old Testament	
myth.....	mythology, mytho- logical	Oxf.....	Oxford	
N.....	Nitrogen	oz.....	ounce, ounces	
N. or n....	North, -ern, -ward	P.....	Phosphorus	
n.....	noun	p.; pp ..	page; pages	
n or neut...	neuter	p., or part..	participle	
Na.....	Sodium [Natrium]	Pa. or Penn.	Pennsylvania	
Nah.....	Nahum	paint ..	painting	
		palæon....	palæontology	
		parl.....	parliament	
		pass.....	passive	

ABBREVIATIONS.

pathol or
 path..... pathology
 Pb.....Lead [*Plumbum*]
 Pd.....Palladium
 Penn or Pa. Pennsylvania
 perf.....perfect
 perh.....perhaps
 Pers.....Persian, Persic
 pers.....person
 persp... ..perspective
 pert.....pertaining [to]
 Pet... ..Peter
 Pg. or Port. Portuguese
 phar.....pharmacy
 PH.D.....Doctor of Philoso-
 phy
 Phen.....Phenician
 Phil.....Philippians
 Philem....Philemon
 philol....philology, philologi-
 cal
 philos. { philosophy, philo-
 or phil... } sophical
 phonog....phonography
 photog....photography
 phren... ..phrenology
 phys.....physics, physical
 physiol...physiology, physi-
 ological
 Pied.....Piedmontese
 Pl.....Plate
 pl. or plu...plural
 Pl. D.....Platt Deutsch
 plupf.....pluperfect
 P.M.....afternoon[*post meri-*
 diem]
 pneum.....pneumatics
 P. O.....Post-office
 poet.....poetical
 Pol.....Polish
 pol econ...political economy
 polit.....politics, political
 pop... ..population
 Port. or Pg. Portuguese
 poss.....possessive
 pp.....pages
 pp.....past participle, per-
 fect participle
 p. pr.....present participle
 Pr. or Prov. Provençal
 pref.....prefix
 prep.... ..preposition
 Pres.....President
 pres.....present
 Presb.....Presbyterian
 pret.....preterit
 prim.....primitive
 priv.....privative
 prob.....probably, probable
 Prof.....Professor
 pron.....pronoun
 pron.....pronunciation, pro-
 nounced
 prop.....properly
 pros.....prosody
 Prot... ..Protestant
 Prov. or Pr. Provençal
 Prov.....Proverbs
 prov.....province, provincial
 Prov. Eng. Provincial English
 Prus.....Prussia. -n
 Ps.....Psalm, Psalms
 psychol...psychology

pt.....past tense
 pt.....pint
 Pt.....Platinum
 pub.....published, publisher,
 publication
 pwt.....penny weight
 Q.....Quebec
 qt.....quart
 qtr.....quarter [weight]
 qu.....query
 q.v.....which see [*quod*
 vide]
 R.....Rhodium
 R.....River
 Rb.....Rubidium
 R. Cath...Roman Catholic
 rec. sec...recording secretary
 Ref.....Reformed
 refl.....reflex
 reg.....regular, -ly
 regt.....regiment
 rel. pro. or
 rel.....relative pronoun
 repr.....representing
 repub.....republican
 Rev... ..Revelation
 Rev.....The Reverend
 Rev. V.....Revised Version
 rhet.....rhetoric, -al
 R. I.....Rhode Island
 R. N.....Royal Navy
 Rom.....Roman, Romans
 Rom.....Romanic or Ro-
 mance
 Rom. Cath. { Roman Catholic
 Ch. or R. }
 C. Ch.... } Church
 r.r.....railroad
 Rt. Rev...Right Reverend
 Ru.....Ruthenium
 Russ.....Russian
 r.w.....railway
 S.....Saxon
 S.....Sulphur
 s.....second, seconds
 s. [l. s. d.]..shilling, shillings
 S. or s.....South, -ern, -ward
 S. A. or
 S. Amer..South America, -n
 Sam.....Samaritan
 Sam.....Samuel
 Sans, or
 Skr.....Sanskrit
 Sb.....Antimony [*Stibium*]
 s.c.....understand, supply,
 namely [*scilicet*]
 S. C. or
 S. Car....South Carolina
 Scand.....Scandinavian
 Scot.....Scotland. Scotch
 scr.....scruple, scruples
 Scrip.....Scripture [s], Scrip-
 tural
 sculp.....sculpture
 S. D.....South Dakota
 Se.....Selenium
 sec.... ..secretary
 sec.....section
 Sem.....Semitic
 Sep.....September
 Serv.....Servian
 Shaks.....Shakespeare
 Si.....Silicon

ABBREVIATIONS.

Sic.	Sicilian	trigon.....	trigonometry
sing	singular	Turk.....	Turkish
sis.	sister	typog.....	typography, typographical
Skr. or		U.....	Uranium
Sans....	Sanskrit	ult.....	ultimate, -ly
Slav.....	Slavonic, Slavic	Unit.....	Unitarian
Sn	Tin [<i>Stannum</i>]	Univ.....	Universalist
Soc.....	Society	Univ....	University
Song Sol...	Song of Solomon	U. Presb...	United Presbyterian
Sp.....	Spanish	U. S....	United States
sp. gr....	specific gravity	U. S. A....	United States Army
sq.....	square	U. S. N....	United States Navy
Sr.....	Senior	Ut.....	Utah
Sr	Strontium	V.....	Vanadium
.....	Saint	v.....	verb
.....	street	Va.....	Virginia
stat.....	statute	var.....	variant [word]
s.T.D.....	Doctor of Sacred Theology	var.....	variety of [species]
subj.....	subjunctive	Ven.....	Venerable
suf.....	suffix	Venet.....	Venetian
Su. Goth...	Suo-Gothic	vet....	veterinary
superl ..	superlative	v. i. or	
Supp.....	Supplement	v. intr....	verb intransitive
Supt	Superintendent	vil.....	village
surg.....	surgery, surgical	viz.....	namely, to-wit [<i>vide licet</i>]
Surv.....	surveying	v. n.....	verb neuter
Sw.....	Swedish	voc	vocative
Swab.....	Swabian	vol.....	volume
sym.....	symbol	vols.....	volunteers
syn.....	synonym, -y	Vt.....	Vermont
Syr.....	Syriac, Syrian	v. tr....	verb transitive
.....	town	W.....	Tungsten [<i>Wolfram</i>]
Ta....	Tantalum	W	Welsh
Tart.....	Tartar	W. or w....	West, -ern, -ward
Te.....	Tellurium	Wal	Walachian
technol ...	technology	Wall.....	Walloon
teleg.....	telegraphy	Wash.....	Washington
Tenn.....	Tennessee	Westph....	Westphalia, -n
term.....	termination	W. Ind. ...	West Indies, West
terr.....	territory	or W. I....	Indian
Teut.....	Teutonic	Wis.....	Wisconsin
Tex.....	Texas	wt.....	weight
Th.....	Thorium	W. Va.....	West Virginia
theat	theatrical	Wyo.....	Wyoming
theol.....	theology, theological	Y.....	Yttrium
therap.....	therapeutics	yd.....	yard
Thess.....	Thessalonians	yr.....	year
Ti.....	Titanium	Zech.....	Zechariah
Tim.....	Timothy	Zeph.	Zephaniah
Tit.....	Titus	Zn.....	Zinc
Tl.....	Thallium	zool.....	zoology, zoological
toxicol....	toxicology	Zr.....	Zirconium
tp.....	township		
tr. or trans.	transitive		
transl.....	translation, trans. lated		

See also ABBREVIATIONS in Vol. I.

IMPERIAL ENCYCLOPEDIA AND DICTIONARY.

MER'CURY AND MERCU'RIALS, MEDICINAL USES
OF: applications important and various. Liquid mercury is no longer used in medicine, though, until lately, it was occasionally given with the view of overcoming, by its weight, obstructions in the intestinal canal. There are, however, many preparations which owe their value to *extinguished* mercury; that is to say, to mercury triturated with chalk, saccharoid matters, oil, etc., till globules can no longer be detected in it. It is possible that, in these cases, the metal is partly reduced to the state of suboxide. Among these preparations are—*Mercury with Chalk*, or *Gray Powder* (*Hydrargyrum cum Cretâ*), the mildest and best mercurial to administer to infants and children, the dose varying with the age; *Blue Pill* (q.v.); and the various ointments, liniments, and plasters of mercury. *Calomel* (termed in some of the pharmacopœias, *Hydrargyri Chloridum*, for the same reason that corrosive sublimate, as above mentioned, is termed in the same works *Hydrargyri Bichloridum*) has been perhaps more given than any other medicine of this class, though now less frequently used, and may be regarded, so far as its action is concerned, a type of mercurials generally. Given in small doses, the first effects of these medicines are observed in the increase of the various secretions, e.g. of the saliva (see SALIVATION), of the various fluids poured into the intestinal canal, and sometimes of the urine. It is very doubtful whether, as is generally believed, mercurials increase the secretion of the essential constituents of the bile. The watery portion is undoubtedly, and the coloring matter probably, increased. When continued in small doses for some time, they cause the absorption of morbid fluids, and even of morbid products that have assumed a partially solid form. The following are some of the diseases in which they are of most importance: (1), In *internal congestions*, as of the liver, etc., to increase the secretions, and hence relieve the vessels of the affected organ; (2), in various *acute inflammations*, especially of serous mem-

branes (q.v.), of the structure of the liver and of the lungs, etc.; (3), in numerous forms of *chronic inflammation*; (4), in *dropsies*, dependent on inflammation of serous membranes or disease of the liver, but not in dropsy from disease of the kidneys, where these medicines are generally injurious; (5), in numerous *chronic affections* in which an alterative action is required; and (6) as a purgative (to be followed by a black draught), when a patient is in the condition popularly known as bilious (in this case blue pill is usually as efficacious as calomel).

In *syphilis*, mercurials were formerly universally prescribed; now they are not considered essential to the cure, except in comparatively few cases.

If calomel, blue pill, or any other mercurial be given in too large a dose, or for too long a period, most serious consequences may result—such as, very profuse salivation, with swelling of the tongue and gums, and loosening of the teeth; purging; certain skin affections; disease of the periosteum and of the bones (formerly ascribed to syphilis, but in reality due oftener to the supposed remedy); and a low, febrile condition (termed mercurial erythism), accompanied with great general prostration.

The doses of calomel for an adult vary from 3 to 6 grains when taken as a purgative. If the object is to affect the system generally, as in the case of acute inflammation, small doses (half a grain to two grains, combined with a little opium) should be given several times a day; while as an alterative, still smaller doses (not sufficient at all to affect the mouth) should be prescribed. The *Compound Calomel Pill* popularly known as *Plummer's Pill* (in which the calomel is associated with oxysulphide of antimony and guaiacum) is a most valuable alterative in chronic skin-diseases—a five-grain pill to be taken every night.

Corrosive sublimate (the *Bichloride* of the pharmacopœias, and *Oxymuriate* of the older chemists), though a very powerful irritant poison, is extremely useful in very minute doses as an alterative in many chronic affections of the nervous system, the skin, etc. The dose varies from one-thirtieth to one-eighth of a grain; the average dose of its pharmacopœial solution, the *Liquor Hydrargyri Bichloridi*, being one drachm, which contains one-sixteenth of a grain of the salt. This medicine should never be given on an empty stomach.

The above are the chief mercurial preparations given internally. Certain external applications require a few remarks. The plasters, ointments, and liniments are absorbed by the skin, and act in the same manner as mercurials taken internally.

White Precipitate Ointment is the universal application for destruction of lice; and is a useful stimulating application in chronic skin-diseases. *Ointment of Nitrate of Mercury*, popularly known from its yellow color as *Citrine*, or *Golden Ointment*, is, when sufficiently diluted, a most useful stimulating application in inflammation

of the eyelids, in indolent ulcers, etc.; and the *Ointment of Nitric Oxide of Mercury* is similar in its action. For the precipitated suboxide that occurs in *Black Wash*, and its use as a local application, see LINIMENT.

The *toxicological* relations of the mercurial compounds must be briefly glanced at. There are cases on record in which, probably from some peculiarity of constitution, ordinary and even small doses of the milder mercurials have caused death; thus, Christison mentions a case in which two grains of calomel destroyed life by severe salivation and by ulceration of the throat; and similar cases in which small doses of gray powder, blue pill, and calomel have proved fatal, are recorded by Taylor in *Medical Jurisprudence*. The preparations used for poisoning are mainly corrosive sublimate, and white and red precipitates, corrosive sublimate being used in at least four-fifths of the cases. The symptoms produced by a poisonous dose of this salt come on immediately, there being during the act of swallowing an intense feeling of constriction, and a burning heat in the throat, while a metallic taste is left in the mouth. Violent pain in the stomach and abdomen is felt in a few minutes, and vomiting of mucus and blood, and purging follow. The pulse becomes small, frequent, and irregular, the tongue white and shrivelled, the skin cold and clammy, the respiration difficult, and death is preceded by fainting or convulsions. Any dose exceeding two grains would probably prove fatal to an adult, unless vomiting were promptly induced, or the whites of eggs administered. Death ensues usually in from one to five days, but may take place in less than half an hour, or not for three weeks or more.

MERCY, n. *mér'si* [F. *merci*, a benefit or favor, pardon; It. *mercede*, reward, mercy—from L. *mercēs* or *mercēdem*, earnings, desert]: the act of sparing; pity; compassion; willingness to spare and save; clemency; pardon. MER'CIFUL, a. *-sī-fūl*, compassionate; tender; humane; willing to pity and spare. MER'CIFULLY, ad. *-lī*. MER'CIFULNESS, n. *-nēs*, tenderness; willingness to spare; readiness to forgive. MER'CILESS, a. *-sī-lēs*, without mercy; hard-hearted; cruel; unsparing. MER'CILESSLY, ad. *-lī*. MER'CILESSNESS, n. *-nēs*, want of mercy or pity. MERCY-SEAT, the covering of the ark of the covenant among the Jews; God's throne. TO BE AT THE MERCY OF, to be wholly in the power of; to have no means of defense or safety. SISTERS OF MERCY, or *Order of our Lady of Mercy*, religious order of women in the Rom. Cath. Chh., founded in Dublin, A.D. 1827, who devote themselves to the succor and protection of the sick and destitute, and to visit hospitals and prisons (see SISTERHOODS).—SYN. of 'merciful': gracious; kind; mild; benignant; clement—of 'merciless': unmerciful; unfeeling; severe; barbarous; savage; remorseless; ruthless; pitiless;—of 'mercy': leniency; commiseration; sympathy; condolence; grace; tenderness; mildness,

MERE, a. *mēr* [L. *merus*; It. *mero*, alone, unmixed: Dut. *maar*, only, no more than: comp. Gr. *meros*, a part—from *meiro*, I divide]: this or that only; distinct from anything else; simple; absolute. MERE'LY, ad. -lŷ, simply; solely; in OE., absolutely; utterly; entirely.—SYN. of 'merely': barely; wholly; purely; hardly; scarcely; unmixedly.

MERE, or MEAR, n. *mēr* [see MEERE]: in OE., a boundary: V. to limit; to bound. MER'ING, imp. MERED, pp. *mērd*.

MERE, n. *mēr* [F. *mare*; Dut. *maer*, a pool: mid. L. *mara*, water generally: Ger. *meer*; Icel. *marr*; W. *môr*; Gael. *muir*; L. *mārē*, the sea]: a pool or lake.

MER'EDITH, GEORGE: English novelist and poet; 1828, Feb. 12— ————; b. Hampshire, Eng. He was educated in Germany, and prepared himself for the legal profession, but early entered on a literary career, publishing (1851) a vol. of poems, (1855) a prose burlesque, *The Shaving of Shagpat*, and (1857) *Farina*, a legend of Cologne. A philosophical novel, *The Ordeal of Richard Feverel*, first brought him prominently before the public as a thoughtful and serious writer of great power. *Evan Harrington*, a social comedy, was published in 1861; *Modern Love*, poems and ballads (1862); *Emilia in England* (1864); *Rhoda Fleming* (1865); *Vittoria*, sequel of *Emilia in England* (1866); *The Adventures of Harry Richmond* (1871); *The Egoist* (1879); *The Tragic Comedians* (1881), a novel founded on the life and tragic death of the German socialist, Ferdinand Lasalle; *Poems and Lyrics of the Joy of Earth* (1883); *Diana of the Crossways* (1885); *Ballads and Poems of Tragic Life* (1887); *A Reading of Earth* (1888). *One of Our Conquerors*, a novel, was published 1890; *Lord Ormont and His Aminta* (1894); and *The Amazing Marriage* (1895). He has issued other short tales and poems. A vol. of poems, *The Empty Purse*, appeared 1892. The same year M. was elected, as the successor of Tennyson, pres. of the Incorporated Soc. of Authors. M.'s novels are valued by thoughtful readers as studies of social problems, as well as for their skilful analysis of character, but are so elaborate and even obscure in style as to fail of wide popularity.

MER'EDITH, OWEN: see LYTTON, EDWARD ROBERT, Earl.

MEREDITH, *mēr'è-dīth*, SAMUEL: 1740–1817, Mar. 10; b. Philadelphia; son of a Welshman who was a friend of Washington. M. became a member of the Penn. colonial legislature; and when the American revolution broke out, he entered the colonial army as maj., took part in several battles, and was made brig.gen. for gallant services. He gave £10,000 in silver for carrying on the war; and was exiled from Philadelphia when the British occupied it. 1787–88, he served in congress; 1789–1801, he was the first treasurer of the United States, advancing to the government, on taking the office, \$20,000, and later \$120,000, for which he was never reimbursed. He died at his country-seat at Belmont, Luzerne co., Penn.

MEREDITH—MERETRICIOUS.

MER'EDITH, WILLIAM MORRIS, LL.D.: 1799-1873, Aug. 17; b. Philadelphiia. He graduated at the Univ. of Pennsylvania 1812; studied law; and, 1820, began practice. 1824-28, he served in the legislature; 1834-1849, was pres. of the Philadelphia select council; 1837, served as member of the Penn. constitutional convention; 1849, was made sec. of the U. S. treasury, and held the office until Pres. Taylor's death 1850. He was attorney-gen. of Penn. 1861-67; and pres. of the state constitutional convention 1873. He stood high in his profession for ability and integrity, and had few superiors as a ready speaker and logical debater. He was constantly employed on important cases before the supreme court; and, 1871, was offered, but declined, the position of counsel for the United States at the Geneva conference on the Alabama question. He died at Philadelphia.

MERENCHYMA, n. *měr-ěng'kĩ-mǎ* [Gr. *meris*, a part, a particle; *engchũma*, what is poured in, the substance of organs—from *engchũō*, I infuse]: in *bot.*, tissue composed of rounded cells.

MERETRICIOUS, n. *měr'ě-trĩsh'ūs* [L. *meretrĩcĩus*, pertaining to a harlot—from *merētrix*, a harlot]: that is practiced by harlots; alluring by false show; having a gaudy but deceitful appearance. **MER'ETRI'CIOUSLY**, ad. -*lĩ*. **MER'ETRI'CIOUSNESS**, n. -*něs*, the quality of being meretricious.

MERGANSE, n. *mér-găn'sér* [Sp. *mergansar*—from Sp. *mergo*; L. *mergus*, a diver or gull—from L. *mergo*, dip, I dive: Sp. *ansar*; L. *anser*, a goose], (*Merginæ*) sub-family of birds of family *Anatidæ*, having a slender, straight, much compressed bill, hooked at the tip and notched at the edges, almost furnished with teeth see BILL. All these species of ducks are inhabitants of the seas and coasts of n. regions, but migrate southward in winter. The Goosander (q.v.) is the largest and best known of the species. The RED-BREASTED M. (*M. serrator*) is found in all the n. parts of the world. It is not much smaller than the goosander, which it much resembles.—The HOODED M. (*M. cucullatus*), a smaller species only about 18 inches in entire length, is very plentiful in N. America.

MERGE, v. *mérj* [L. *mergĕrĕ*, to dip or plunge under water: It. *mergere*]: to sink; to cause to be swallowed up; to be swallowed up or lost. MERG'ING, imp. MERGED, pp. *mérjd*.

MERGER, *mérj'ér*, in Law: extinguishment of a right by reason of its coinciding in the same person with another right of higher value in the estimation of law, and this may take place with or without the intention of the parties. The less right ceases to exist, but the greater right is not increased by the union. A M. may arise either of rights or of estates.

When a person acquires security of a higher value in the law than that which he possesses for a right or cause of action, his remedies are merged into those attaching to the greater security. Thus if a bond is given for simple contract debt, the right of action for the contract indebtedness ceases, and an action must be brought on the bond; or if one sues another on his promise or on the indebtedness of any kind or for a wrong of any kind, and recovers a judgment, the original cause of action merges or is lost in the judgment.

M. in estates takes place when a less and a greater estate meet in the same person without an intervening estate; thus a mortgage will become merged in a deed when the owner of the mortgage becomes the owner of the mortgaged property, and this M. is regarded as payment of the mortgage debt; or if an estate in fee descends to a person owning the life estate, the life estate is merged in the fee and ceases to exist. In order that M. of estates shall take place, the estates must be in the same property, must meet in the same person at the same time, and one estate must be inferior to the other as a matter of law, though perhaps not as a matter of fact. Thus an estate for a term of years, however many, would merge in an estate for life, which is necessarily of a limited number of years; an estate for life being in law a greater estate than an estate for a term of years. Where there is union of a legal and equitable estate in one person, the equitable or trust estate is extinguished being merged in the legal estate; e.g., when a person for

MERGUI—MERIDA.

whom an estate is held in trust, becomes the legal owner of the estate, the trust ceases, and the legal estate remains freed of the trust.

In criminal law a less offense will be merged in a greater offense committed by the same person; thus a murder committed by blows, will include the assault and battery; but when the offenses are of equal degree no M. will take place. The law that when a person commits a crime that involves a wrong against some private person, the private wrong is merged in the crime, is generally abolished; so that the person committing the crime is now civilly responsible to the person whom he has wronged.

MERGUI, *měr-ghě'*: town and seaport of Mergui, one of the Tenasserim Provinces, British Burmah; on an island in the delta of the M. river; lat. $12^{\circ} 27'$ n., long. $98^{\circ} 42'$ e. It is about three m. in circuit, and is surrounded by a stockade. Its harbor is spacious and secure. Exports: sapan wood, dried fish, ivory, etc. Pop. (1881) district 56,559; town 8,633.

MERGUI' ARCHIPEL'AGO: group of 207 islands in the Gulf of Bengal, off the s. shores of the Tenasserim Provinces, lat. 9° to 13° n. The islands are mountainous, some rising 3,000 ft. above sea-level. Pearls are found on the coasts of many of them; and edible birds'-nests, which are sold to the Chinese and Malays, as also timber and coal, are among chief articles of export.

MERICARP, n. *měr'ĩ-kârp* [Gr. *meris*, a part; *karpos*, fruit]: the half of the fruit of an umbelliferous plant, like the hemlock.

MERIDA, former name of Los Andes, state in n.w. Venezuela; bounded n. by Zulia (Maracaybo), e. by Truxillo and Barinas, s. by Barinas and the United States of Colombia, w. by Pampnora; 10,000 sq. m.; cap. Merida. The surface consists of elevated table-lands and valleys, spurs of the Andes Mts. traversing it in all directions; it has 31 peaks over 10,000 ft. high; one, belonging to the Sierra Nevada range, being 15,066 ft. in height. The Grita, navigable 50 m. from its junction with the Zulia, is the largest of its numerous rivers. There are a number of considerable lakes, that of Lagunilla, 3,000 ft. above sea-level, yields quantities of sesquicarbonate of soda. Its productions are those common to the torrid and temperate zones. Pop. (1891) 336,146.

ME'RIDA: town of Venezuela, S. Amer., cap. of state of Los Andes., about 60 m. s. of the Lake of Maracaybo. It was formerly the largest and one of the most important cities of Venezuela; but in 1812 it was almost wholly destroyed by an earthquake, from which misfortune it has somewhat recovered, and is again flourishing. Pop. (1881) 10,747; (1891) 12,018.

MERIDA, *měr'ē-thâ* (anc. *Augusta Emerita*): small, decayed town of Spain, province of Estremadura, on the right bank of the Guadiana, 32 m. e. of Badajoz. It is

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unique in Spain, and is in some points a rival of Rome itself, on account of the number and magnitude of its remains of Roman antiquity. The Guadiana is here crossed by a Roman bridge of 81 arches, and with a length of 2,575 ft., and a breadth of 26 ft.: it was erected by Trajan. There is another Roman bridge over the Albarregas, 450 ft. long, 25 ft. wide, still quite perfect, in spite of the traffic of 17 centuries. There are also remains of a castle built by the Romans; and among other most noteworthy monuments of antiquity are an old half-Roman, half-Moorish palace, the Casa de los Corvos, constructed out of a temple dedicated to Diana, several aqueducts, an ancient theatre, and a circus. M. was built B.C. 23, and flourished in great splendor, until, 1228, it was taken from the Moors, after which it began to decline. Pop. 7,390.

MERIDA, *měr'ê-dâ* or *měr'ê-thâ*: city, cap. of Yucatan, Mexico; on a barren plain, 25 m. from the Gulf of Mexico, lat. 20° 50' n., long. 89° 40' w. It occupies the site of a former native city, and was founded by the Spaniards 1542. M. has a university, a cathedral, and 13 churches. Its port is Sizal, with which it communicates by a good road. Its trade and manufactures are not extensive. Pop. (1890) 32,000, almost all Indians and half-bloods; (1900) 34,630.

MERIDEN, *měr'i-dên*: city in New Haven co., Conn.; incorporated as a borough, 1806; as a city, 1867; beautifully located on high ground, on the New York New Haven and Hartford r.r., about 18 m. n.e. of New Haven, 94 m. n.e. of New York. The original settlement was in 1660, when Belcher built there a fortified inn. M. is well laid out, paved, and lighted, has a paid fire department, and is one of the most prosperous manufacturing centres of New England. The place is divided into Meriden, West Meriden, and South Meriden, each with its own post-office, and the centre of a considerable trade. M. contains the city hall and several national banks: West M. is the principal place. Daily and weekly newspapers are published. 1900 there were 260 manufactories employing a capital of \$16,699,004, using materials worth \$5,861,612, having a product valued at \$13,485,640. They consist mainly of britannia and electro-plated silverware, cutlery, iron castings, tin-ware, steel, rolled brass, bronzes, cement pipe, gas fixtures, firearms, carriages, machinery, malleable iron, flint glass, and woolen goods. The M. Britannia Co. is the largest factory of the kind in the world, employing more than 1,000 hands, and producing annually nearly \$3,000,000 worth of britannia metal and electro-plated goods; it has 6 or more large buildings, and consumes about 420 tons of metal every year. The M. cutlery employs over 400 hands. The state reform school for boys is in M., and has more than 300 inmates. There were 1902, Sept., 3 nat. banks (cap. \$800,000) 2 savings banks, and a trust and safe deposit company, and a fire insurance company with \$371,808 assets and \$97,748 liabilities; the public school

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system is well organized with about 40 school buildings; and there are some handsome structures among the 18 churches of the city. Pop. (1870) 10,495; (1880) 18,340; (1890) 21,652; (1900) 24,296.

MERIDIAN, n. *mě-rĭd'ĭ-ăn* [F. *méridien*, circle in astronomy—from L. *meridiānus*, belonging to midday—from *meridiēs*, midday—from *mēdiūs*, middle; *dĭēs*, day]: midday or noon: thence the highest point of anything; culmination, as of life or of fame. M. is applied technically in geog. (*Terrestrial M.*) and in astron. (*Celestial M.*), denoting the imaginary great circle of the celestial sphere which passes through both poles of the heavens, and also through the zenith and nadir of any place on the earth's surface, cutting the equator at right angles: every place on the earth's surface has consequently its own M. The M. is divided by the polar axis into two equal portions, which stretch from pole to pole, one on each side of the earth. It is midday at any place on the earth's surface, when the centre of the sun comes upon the M. of that place; at the same instant it is midday at all places under the same half of that M., and midnight at all places under the opposite half. All places under the same M. have therefore the same longitude (see **LATITUDE AND LONGITUDE**); and the term M. is applied to the brass ring surrounding a globe, on which the degrees are marked. Stars attain their greatest altitude when they come upon the M.; the same thing is true approximately of the sun and planets; and, as at this point the effect of refraction upon these bodies is at a minimum, and their apparent motion is also more uniform, astronomers prefer to make their observations when the body is on the M. The instruments used for this purpose are called *meridian circles*: see **CIRCLE**, **MURAL**. **MERIDIAN**, a. being on the meridian or at midday; pertaining to the highest point. **MERIDIONAL**, a. *mě-rĭd'ĭ-ō-nal*, pertaining to the meridian; southerly; having a southern aspect. **MERID'IONALLY**, ad. *-lĭ*.

MERID'IAN: a city in Lauderdale co., Miss.; at the junction of the Vicksburg and Meridian, and the Alabama Great Southern r.r., on the Mobile and Ohio r.r.; about 135 m. n.w. of Mobile, 96 m. e. of Jackson. Situated in the midst of the lumber region, it has a flourishing trade, and manufactures cotton goods and yarn, furniture, sashes, doors, blinds, and plows; it has several foundries, machine-shops, steam corn-mills, and soda-water factories. It has a fine court-house, numerous churches and good schools, besides 2 female colleges; and publishes daily and weekly newspapers. Its railways were utterly demolished by Gen. Sherman, 1864, Feb. 16. Pop. (1890) 10,624; (1900) 14,050.

MERIDIAN MEASUREMENT—MÉRIMÉE.

MERIDIAN MEASUREMENT: determination of the form and size of the earth from the measurement of a part of a meridian—a favorite problem with mathematicians from the earliest times, though till the middle of the 18th c. their operations had not exactness sufficient to give their conclusions much value. Since that time geodesy has so rapidly advanced, through invention of more accurate instruments, and discovery of new methods, that the measurement of the meridian is now performed with utmost accuracy. The *modus operandi* is as follows: Two stations, having nearly the same longitude, are chosen; their latitude and longitude are accurately determined (the error of a second in latitude introduces a considerable error into the result), and the direction of the meridian to be measured ascertained; then a base line is measured with the greatest accuracy, as an error here generally increases at every subsequent step; and then, by the method known as Triangulation (q.v.), the length of the arc of the meridian contained between the parallels of latitude of the two stations is ascertained. As the previously found latitudes of its two extremities give the number of degrees that it contains, the average length of a degree of this arc can be at once determined; also—on the supposition that the length of a degree is uniform—the length of the whole meridional circumference of the earth. This operation of meridian measurement has been performed at different times on a great many arcs between 68° n. lat. and 38° s. lat., and the results show a steady though irregular increase in the length of the degree of latitude, as the latitude increases. On the supposition that this law of increase holds good to the poles, the length of every tenth degree of latitude in English ft. is as in the following table:

Degree of Latitude.	Length of Degree in English Ft.	Degree of Latitude.	Length of Degree in English Ft.
0°	362,732	50°	364,862
10°	362,843	60°	365,454
20°	363,158	70°	365,937
30°	363,641	80°	366,252
40°	364,233	90°	366,361

This result shows that the earth is not spherical, as in that case the length of all degrees of latitude would be alike, but of spheroidal form—its curvature becomes less as we go from the extremity of its greater or equatorial diameter to the pole: see EARTH. It was by the measurement of a meridional arc 1792-99, that the length of a quadrant of the earth's circumference was determined in order to form the basis of the French metrical system (see MÈTRE).

MÉRIMÉE, *mā-re-mā'* PROSPER: novelist, historian and archæologist, great master of French style: 1803-83. Sep. 28—1870, Sep. 23; b. Paris; son of Jean François Leonore M., painter of distinction, and sec. to the Éco

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les Beaux Arts. The son entered the College of Charlemagne, studied law, and early became acquainted with English and Spanish literature. The influence of Shakespeare, Calderon, and Goethe was then making itself felt in France, and the Romantic School, headed by Victor Hugo, was contending for possession of the stage against the classic traditions of Racine. M., a devotee of the new sect, published under a double disguise his first work, *Le Théâtre de Clara Gazul*, a collection of studies for the stage, professing to be translated from the Spanish by a certain Joseph L'Estrange. This work raised great expectations, which were never realized. M. did not become a dramatist, and one of these pieces failed when represented 1850. His next publication, also pseudonymous, *La Guzla, by Hyacinthe Maglanovitch*, was an effort to embody the spirit of the popular lays of Illyria and Montenegro. It was written to meet the then prevailing rage for Slavonic poetry, and the materials were taken at second-hand: it was, however, admired in Germany, and received the approval of Goethe. M. then became a regular contributor to the *Revue de Paris* and the *Revue des Deux Mondes*; and after one or two more anonymous efforts, signed his name to *Tamango*. After the revolution of July, he entered public life, and before long was made Inspector of Historical Monuments. During all this time, he continued to write for his favorite Reviews a series of romantic tales, in which terrible, almost repulsive subjects are handled with wonderful realistic power, and in a style singularly clear, condensed, and vigorous. This series, in which the *Etruscan Vase* and the *Capture of the Redoubt* especially are noteworthy, culminated in *Colomba* (1841), written by him when fresh from Corsica and its tales of vengeance. After this, his greatest and (with the exception of *Arsène Guillot* and *Carmen*) his last romance, M. applied himself to historical researches. The *Conspiracy of Catiline* and the *Social War*, studies of Roman history, preliminary to a Life of Cæsar, on which he is said to have been occupied many years, appeared 1844. In this year, he was elected to the chair in the Acad. vacated by the death of C. Nodier. His *History of Dom Pedro the Cruel* (1848), dedicated to the Countess of Montijo, mother of the Empress Eugénie, was translated into English (1850). After the fall of the Orleans dynasty, he was placed on the commission to draw up an inventory of the art treasures left by them in France. In 1854, he published his *False Demetrii*, an episode of early Russian history, the preface to which was written in prison, where he was sent for criticising, in the *Revue des Deux Mondes* (1852), the sentence passed on his old acquaintance, M. Libri (q.v.), a sentence which he tried to get reversed in the senate, 1861, June 1. M. also translated from Pushkin and Nicolas Gogol. Among his latest writings are an introduction to Marino Vretro's *Poetry of Modern Greece* (1855), two brief articles in the *Revue des Deux Mondes* (1864); and

Lettres à une Inconnue (1873; Eng. trans. 1874). M. was made senator 1853; pres. of the commission for reorganizing the Bibliothèque Impériale in 1858; commander of the Legion of Honor 1860. He was also one of the ten *membres libres* of the Académie des Inscriptions.—M. was a close friend of Emperor Louis Napoleon though he was not a very active politician. Though naturally warm-hearted, he was early led to assume a skeptical, cynical tone in his writings, and was keenly sarcastic in literary criticisms, and had an artistic delight in the horrible. Thus, naturally but unfortunately, his character often failed to be understood. His style is exceedingly felicitous.

MERINO, n. *mě-rě'nō* [Sp. *merino*, moving from pasture to pasture, as the sheep do which produce the wool: F. *mérinos*, a merino sheep]: important breed of sheep originally Spanish, now widely diffused through other countries, and constituting a great part of the wealth of Australia. The M. has large limbs, and the male has large spiral horns, which do not rise above the head; the skin of the neck is loose and pendulous; the cheeks and forehead bear wool; the fleece is fine, long, soft, and twisted in silky spiral ringlets, abounding in oil, which attracts dust, so that it has generally a dingy appearance. The fleece is sometimes black, and black spots are apt to appear in even the most carefully bred flocks. The M. sheep fattens slowly, and owes its value altogether to the excellence of its wool. It has not been found profitable where the production of mutton is a great part of the object of the sheep-farmer.—The term M. is applied also to the fabric made from the wool of this sheep: see WOOLEN MANUFACTURE.

MERIONETH, *mě-rě-ōn'ěth* or *mě'r'ě-ōn-ěth*: county of Wales, bounded w. by Cardigan Bay, n. by the counties of Caernarvon and Denbigh; greatest length about 44 m., greatest breadth abt. 30 m.; 600 sq. m., or 385,290 acres: chief town Dolgelley (q.v.). The coast s. of the town of Harlech rises into cliffs, is skirted by sands and fringed by three dangerous sandbanks some distance out at sea. M. is the most mountainous county in Wales, though its peaks do not rise to the height of some in Caernarvonshire. The chain comprising the highest peaks runs n.w. to s.e.; its summits are Arran Mowddu (2,955 ft.) and Cader Idris (q.v.). The county is watered by the Dee, which flows n.e. and by the Mawddach and the Dovey, which have a s.w. course. The soil is generally poor, and large tracts are unfit for profitable cultivation. Of the total acreage, only 152,667 acres were under crop 1880; and of this portion 116,221 acres were in permanent pasture. There were 413,473 sheep in the county. Slate and limestone are largely quarried; a little lead and copper is mined; and of late gold has been found. In 1866, there were obtained at Castell Carndochan 529 oz. of gold, and at Vigra and Clogau 214 oz. Woolens and flannels are manufactured. Pop. (1881) 54,793; (1891) 49,204; (1901) 47,774.

MERISMATIC, a. *měř'iz-măt'ík* [Gr. *merismos*, division—from *meris*, a part]: taking place by division or separation, as into cells or segments.

MERISPORE, n. *měř'í-spōr* [Gr. *meris*, a part; *spora*, seed]: in *bot.*, a cell capable of germination, formed by the division of an ascospore or a basidiospore.

MERISTEM, n. *měř'í-stěm* [Gr. *meristos*, separated, divisible—from *merizo*, I divide into parts]: in *bot.*, tissue formed of cells which are all capable of dividing, and producing new cells; also called 'generative tissue,' or cambium.

MERIT, n. *měř'it* [F. *mérite*—from L. *meritum*, desert, merit: It. *merito*, merit, desert]: goodness or excellence entitling to honor or reward; value or excellence; that which is earned or deserved; desert: V. to deserve, in a good or bad sense; to have a just title to; to earn. **MER'ITING**, imp. **MER'ITED**, pp.: **ADJ.** deserved. **MERITORIOUS**, a. *měř'í-tō'ri-ūs* [L. *meritōriūs*, that brings in money—from *měřěō*, I acquire, I earn]: praiseworthy; deserving of reward or fame. **MER'ITO'RIOUSLY**, ad. *-ūs-lī*. **MER'ITO'RIOUSNESS**, n. *-nēs*, state or quality of deserving a reward.

MERITHAL, n. *měř'í-thāl* [Gr. *meris*, a portion; *thallos*, a young shoot, a bough]: in *bot.*, a term used for 'internode'; a term applied to the different parts of the leaf. **MERITHALLI**, n. plu. *měř'í-thāl'ī*, the three principal parts of a plant—the *radicular merithal* corresponding to the root, the *cauline* to the stem, and the *foliar* to the leaf.

MERIVALE, *měř'í-vāl*, **JOHN HERMAN**: English scholar and translator: 1779–1844; b. Exeter. He studied at St. John's College, Cambridge, and was called to the bar 1805. He contributed largely to Bland's *Collections from the Greek Anthology* (1813; second ed. 1833). He wrote *Poems Original and Translated* (1841). His son, the Rev. **CHARLES M.** (b. 1809), studied at St. John's College, Cambridge, where he was successively scholar, fellow, and tutor. He has acquired great reputation as author by his *Fall of the Roman Republic* (1853), *History of the Romans under the Empire*, 8 vols. (1859–65), and *Boyle Lectures* (1864–5), etc. He was installed Dean of Ely 1869.—Another son, **HERMAN M.** (1805–74), was appointed prof. of political economy, Oxford 1837, and permanent under sec. of state for India 1859. In the same year he was made C.B.

MERIWETHER, **DAVID**, *měř'í-wěth-ēr*: 1755–1822, Nov. 16; b. Va. He entered the continental army as lieut.; and, 1779, was taken prisoner at the siege of Savannah. In 1785, he settled in Wilkes co., Ga., which he several times represented in the legislature; 1802–07, he served in congress, being elected to fill a vacancy. In 1804, Jefferson, whose earnest supporter he was, made him Indian commissioner to adjust the claims of the Creeks in Fla.; 1817, he was a presidential elector, and served, the same year, with Gen. Jackson and Gov.

McMinn of Tenn., on the commission which made the treaty with the Cherokees, 1817, July 8, by which a large and valuable tract in Ga. was ceded to the United States. In 1821 he was again presidential elector. He died near Athens, Ga.

MERK, n. *mérk*: an old Scotch silver coin, value 13½ sterling.

MERL, or MERLE, n. *mèrl* [F. *merle*—from L. *merula*, a blackbird]: in *Scot.*, the blackbird (q.v.).

MERLE D'AUBIGNÉ, *mārl dō-bēn-yā'*, JEAN HENRI, popular historian of the Prot. reformation: 1794, Aug. 16—1872, Oct. 21; b. Eaux-Vives, near Geneva, Switzerland. He studied there and at Berlin—under Neander—and subsequently became pastor of the French Prot. Church in Hamburg. After five years, he went to Brussels, and became chaplain of King William, who, after the revolution of 1830, invited him to Holland, as tutor to the Prince of Orange. M. declined, and returning to Geneva, took part in the institution of a new college for propagation of orthodox theology, in which he was appointed prof. of church history. His *Histoire de la Réformation au Seizième Siècle* (1835 et seq.) is written with utmost vivacity, and is sometimes eloquent. Its popularity has been immense in England and the United States as well as on the continent of Europe. Among M. D.'s other writings are—*Le Luthéranisme et la Réforme* (Par. 1844); *Germany, England, and Scotland* (1848); *Le Protecteur, ou la République d'Angleterre au Jour de Cromwell* (1848); *Trois Siècles de Lutte en Ecosse* (1850); *Caractère du Réformateur et de la Réformation à Genève*, and *Histoire de la Réformation en Europe au Temps de Calvin* (1862-77). He died at Geneva.

MERLIN, n. *mér'lin* [Gael. *murluin*, a fish-basket]: in *Scot.*, a fish-basket.

MERLIN, n. *mér'lin* [OF. *esmerillon* and *emerillon*: Ital. *esmeriglio*], (*Falco aesalon* or *Hypotriorchis aesalon*): small species of Hawk, one of the smallest of *Falconidæ*, 8 inches to 12½ inches in length, but very bold and powerful, and possessing all the characters of the true falcon, with the distinction of large hexagonal scales on the front of the tarsi. It is of a bluish ash color above; reddish yellow on the breast and belly, with longitudinal dark spots, the throat of the adult male white. The wings reach to two-thirds of the length of the tail. It builds its nest on the ground, and is fond of localities where large stones are plentiful, on which it is often seen perched, and is therefore often called the *Stone Falcon*. It is common in parts of Europe, is found in Asia very frequently, and extends southward in Africa even to the Cape of Good Hope. It was of great reputation in the days of falconry, being very easily trained, and flying readily at its quarry. It was therefore often used for taking partridges and wood-pigeons. It is a very lively bird, and often utters a harsh scream. It usual

MERLIN.

flies low and very rapidly, threading its way, if necessary, through branches and leaves, but it will also follow its prey in mounting upward to a great height.



Merlin (*Falco aesalon*), Male.

MERLIN, *mér'lin*: ancient Welsh prophet and enchanter, whose date is conjecturally assigned to the period of decline of the native British power in its contest with the Saxon invaders. Both the Cambrian and the Strathclyde Britons boasted of a M. who was, in all probability, the same personage decked out in different legendary guise.—The Cambrian M., called M. *Emrys* or *Ambrosius*, is said by Geoffrey of Monmouth, in his *Historia Brittonum*, to have lived in the 5th c., to have sprung from the intercourse of a demon with a Welsh princess, and to have displayed miraculous powers from infancy. He is alleged to have been the adviser of King Vortigern, and subsequently of Ambrosius, Uterpendragon, and the great King Arthur. He is often alluded to by the earlier poets, especially Spenser, in his *Fairy Queen*, and figures in Tennyson's *Idylls of the King*. A collection of prophecies attributed to him appeared in French (Paris 1498), in English (Lond. 1529 and 33), and in Latin (Venice 1554); and their existence is traceable at least as far back as the time of the poet Lawrence (abt. 1360).—The Strathclyde, or—if we may be allowed an expression which anticipates history—the *Scottish M.*, called Merlin the Wyllt, or Merlin Caledonius, is placed in the 6th c., and appears as a contemporary of St. Kentigern, Bp. of Glasgow. His grave is still shown at Drummelzier on the Tweed, where, in attempting to escape across the river from a band of hostile rustics, he was impaled on a hidden stake. A metrical life of him extending to more than 1,500 lines, professedly based on Armorican materials, and incorrectly ascribed to Geoffrey

of Monmouth, was published by the Roxburghe Club in 1830. His prophecies—published at Edinburgh 1615—contain those ascribed to the Welsh Merlin.

MERLON, n. *mér'lôn* [F. and Sp. *merlon*]: in fort., the part of an embattled parapet between two embrasures, having a usual length of 15 to 18 ft.

MERMAID, n. *mér'mād* [AS. *mere*, a lake; *mægð*, maid: F. *mer*; L. *mārē*, the sea, and Eng. *maid*: Ger. *meer*; W. *mor*, the sea]: fabled sea-woman, the upper half in the shape of a woman, and the lower forming the tail of a fish. MERMAN, n. *mér'mān*, the male of mermaid.—The *Mermaid* is represented usually with the upper parts resembling those of a human being, generally of a woman—though the *Merman* also is sometimes heard of—while the body terminates in the semblance of a fish. There is an evident affinity between the stories concerning mermaids and those concerning the sirens and tritons, perhaps also the nereids, of the ancients. The probability is that these stories originated in the appearance of seals, walruses, and perhaps still more of the herbivorous cetacea, in regions where they are rare, or to persons unaccustomed to see them. Many of the stories concerning mermaids belong to the northern parts of the world, where the herbivorous cetacea are rare, and perhaps some of the solitary seals have often given occasion to them. But the herbivorous cetaceans do occasionally wander into the British, and probably even into more northern seas. Sir James Emerson Tennent says concerning the Dugong (q.v.): 'The rude approach to the human outline observed in the shape of the head of this creature, and the attitude of the mother while suckling her young, holding it to her breast with one flipper, while swimming with the other, holding the heads of both above water; and when disturbed, suddenly diving and displaying her fish-like tail—these, together with her habitual demonstrations of strong maternal affection, probably gave rise to the fable of the mermaid; and thus that earliest invention of mythical physiology may be traced to the Arab seamen and the Greeks, who had watched the movements of the dugong in the waters of Manaar.' There is possibility of the existence in the ocean of cetaceans not yet known to naturalists. In the old and vulgar superstition, the mermaid was a being of supernatural knowledge, who was capable of human loves and hates and of being wedded to a human lover; her life in the sea was a succession of delights, but her association with man usually brought some evil.—The mermaid is a not unfrequent heraldic bearing. In the heraldry of France, she is called a Siren, and in Germany she is occasionally furnished with two fishy tails,

MERMAID'S GLOVE—MEROVINGIANS.

MERMAID'S GLOVE (*Halichondria palmata*): largest fish sponges. It grows in deep water, and is sometimes two ft. in height. It receives its name from the that finger-like arrangement of its branches. It is tiny, and has a very porous surface; rough, with fields of minute fragile spiculæ. Its color is yellow.

MEROBLASTIC, a. *měr'ō-blās'tik* [Gr. *mēros*, a part; *blastē*, a bud]: applied to an ovum whose vitellus is partially segmented, as distinguished from *holoblastic*, which denotes an ovum whose vitellus is wholly segmented: see **HOLOBLASTIC**.

MERODACH, *mē-rō'dāk* or *měr'o-dāk*: a deity of Babylonia of Êa; in the earlier mythology, a herald and champion of the gods; later, the guardian of the empire. He was coupled with Bel or Belus, Jer. l. 2 (see **BABAL**); it is conjectured that in later times the distinction between the two had been lost, and that to M. were ascribed the qualities and powers of the far mightier god. Dathan and Abiram address M. as though holding this view. His name frequently formed a part of Babylonian proper names.

MER'ŌË: see **ETHIOPIA**.

MEROM, *měr'ôm*, **LAKE**; or **LAKE HULEH**, *hō'lēh*: triangular lake in n. Palestine, an expansion of the upper Jordan; 11 m. n. of the Lake of Galilee; about 6 m. long, 1/2 m. wide, 11 ft. deep—though its dimensions vary according to the rains. It was the scene of Joshua's defeat of the Canaanite kings (Josh. xi. 5, 7). It is surrounded by marshes, and large areas of it are covered with yellow and white water lilies and Egyptian papyrus. Its modern Arab name is Hûleh—applied also to the Jordan at near.

MEROPÉ, n. *měr'o-pē* [L.—from Gr. *Meropē*]: in *class.* mythology, one of the Pleiades, who were regarded as daughters of Atlas: see **PLEIADES**.

MEROPIS: island of the Grecian Archipelago: see **COS**.

MEROPS, n. *měr'rōps* [L. and Gr. *merops*, the bee-eater; the bee-eater; a bird of the genus *Meropidae*, living chiefly upon the various species of bees and wasps. See **MEROPIDÆ**: see **BEE-EATER**.

MEROSTOMATA, n. plu. *měr'rō-stōm'ă-tă* [Gr. *mēros*, upper part of the thigh; *stoma*, a mouth]: an order of Crustacea, embracing the king-crabs or horseshoe crabs, in which the appendages placed round the mouth, performing the office of jaws, have their free extremities developed into walking or prehensile organs.

MEROVINGIANS, *mē-rō-vîn'jī-anz*: first dynasty of Frankish kings in Gaul. The name is derived from Meroving, or Merovaens, who ruled about the middle of the 5th century, having united a few tribes under his sway. His son, Chlodwig or Clovis (q.v.), greatly extended his dominions, and on his death, divided his kingdom among his four sons, one of whom, Chlotar or Clotaire I., re-

MERRILL—MERRITT.

united them under his own sway 558. On his death, 568, the kingdom was again divided into four parts—Aquitaine, Burgundy, Neustria, and Austrasia. His grandson, Clotaire II., again united them 613; but after his death, 628, two kingdoms, Neustria and Austrasia, were formed, in both of which the Merovingian kings retained merely nominal power, the real power having passed into the hands of the mayors of the palace.—The dynasty of the M. terminated with the deposition of Childeric III. 752, and gave place to that of the Carolingians (q.v.) or Karlings. M. should be spelt *Merwings*.—The chief authority for the early history of the M. is Gregory of Tours. See Thierry's *Récits Mérovingiens* (1839), Monod, *La Dynastie Mérovingienne* (1863); and German works by Löbell (1869), Richter (1873), and Arndt (1874).

MERRILL: city, cap. of Lincoln co., Wis.: on the Wisconsin river, 17 m. above Wausau, and on the Chicago, Milwaukee and St. Paul railroad. The region furnishes abundance of hard-wood timber, and the principal industry of M. is the manufacture of lumber, of which 140,000,000 feet were used in 1892. M. has 1 high and 6 graded schools, 11 churches, 2 national banks, and 4 weekly papers. Pop. (1890) 6,800; (1900) 8,537.

MERRILL, *mĕr'ĭl*, **WILLIAM E.:** born Fort Howard, Wis., 1837, Oct., d. 1891, Dec. 14; graduated 1859 from West Point Milit. Acad. and received appointment as 2d lieut. of engineers; was promoted 1861 as 1st lieut., 1863 capt., and 1867 major. In the civil war he was chief engineer in the army of the Cumberland, was in the battles of Chickamauga and Missionary Ridge, and was with General Sherman's reinforcements of General Burnside at Knoxville. He rendered important service in building bridges, making surveys, and improving river navigation in the west. In 1883 he was promoted to lieut.col. He published *Iron Truss Bridges for Railroads*, and *Notes on Tidal Rivers*.

MERRIMAC, *mĕr'ĭ-măk*, **RIVER:** rising in N. H., flowing s. into Mass., and then e. and n.e. into the Atlantic Ocean at Newburyport; length about 120 m. It receives several small tributaries, and has numerous falls, affording immense water-power, on the principal of which are the manufacturing towns of Nashua and Manchester, N. H., and Lowell and Lawrence, Mass. It is navigable 100 m. to Haverhill.

MERRITT, *mĕr'ĭt*, **WESLEY:** b. New York, 1836, June 1. He graduated from West Point Milit. Acad. 1860, July. He was connected with the dragoons; promoted 1st lieutenant 1861, May, and capt. 1862, April. In June, 1863, he became brig.gen. of vols. and was brevetted major for brilliant service at the battle of Gettysburg. In 1863-4 he participated in the Virginia campaigns. For gallant service in various engagements he was brevetted lieutenant.col. and col. in the army and major-gen. of vols., and afterward was commissioned major-gen. of volunteers. He died from the battle of Five Forks. He was appointed

MERRY—MERSEBURG.

by Gen. Grant one of the three commissioners to act upon the surrender of the Army of Northern Virginia. After the civil war he was chief of cavalry in different departments, and for several years was actively engaged in protecting the frontier against Indian raids; 1882 became supt. of the Milit. Acad. at West Point; 1887 was promoted brig.gen. in the regular army and succeeded Gen. Wilcox in command of the dept. of Missouri. Being appointed to command the United States army in the Philippines during the SPANISH-AMERICAN WAR (1898), M. sailed for Manila June 28, and landing at Cavité, Manila harbor, July 29, at once assumed direction of affairs. Forcing the fighting, he quickly brought about the surrender of the Spaniards, and entered the city of Manila Aug. 13. Two weeks later he sailed for Paris, where he was to meet the peace commissioners and give the conference the benefit of his views on the general state of the Philippine Islands. He arrived in that city Oct. 3, and appeared before the commission on the 5th. On his return to the United States he was appointed commander of the Department of the East; retired 1900, June 16.

MERRY, a. *mër'ri* [AS. *mirig*, merry, pleasant: Lap. *murre*, delight: Gael. *mir*, to sport; *mireag*, sport]: loudly cheerful; gay of heart; causing laughter or mirth; delightful; in OE., sweet or pleasant; active or brisk. MER'RILY, ad. *-lī*, gayly; cheerfully; with mirth. MER'RINESS, n. *-nēs*, or MERRIMENT, n. *-mēnt*, gayety, with laughter or noise; hilarity. MERRY-ANDREW, *mër'ri-ān'drô* [supposed to have originated from a facetious physician in the time of Henry VIII.]: one who makes sport for others; a buffoon or clown; one who attended a quack doctor to collect a crowd. TO MAKE MERRY, to be jovial; in *Scrip.*, to feast. MERRY-MEETING or -MAKING, a meeting for mirth; a festival. MERRY-THOUGHT, the forked bone of the breast of a fowl, which, pulled and broken between two young people, is supposed to betoken priority of marriage to the one holding the larger piece.—SYN. of 'merry': blithe; blithesome; lively; airy; cheerful; sprightly; gleeful; vivacious; joyous; jocund; sportive; mirthful.

MERSEBURG, *mër'sēh-bûrch*: town of Prussian Saxony, cap. of the circle of M. on the Saale, 60 m. s.s.e. of Magdeburg. The cathedral, a noble specimen of mediæval architecture, is surmounted by four beautiful towers, and has one of the largest organs (4,000 pipes) in Germany. It contains the monument of Rudolf of Swabia, aspirant to the imperial title, who was here defeated and slain (1080) by Henry IV.; a bronze plate in low relief, probably the oldest mediæval effigy extant. The castle—a picturesque edifice, mostly of the 15th c.—was formerly a residence of the Saxon princes. Cotton and woolen goods, paper, and tobacco are manufactured, and bleaching and brewing are carried on. The beer of M. is famous. Near M. Emperor Henry the Fowler gained his victory over the Hungarians 934.—Pop. (1890) 17,669.

MERSEY—MERTHYR-TYDVIL.

MERSEY, *mér'zǐ*: important river of England, separating in its lower course, the counties of Cheshire and Lancashire. Its origin is in the junction of the Thame and Goyt, on the borders of Derbyshire, e. of Stockport. It flows w.s.w., and is joined on the right by the Irwell from Manchester, at which point it becomes navigable for large vessels. Besides the Irwell, the chief affluents are the Bollin and the Weaver, from Cheshire. At its junction with the Weaver, the M. expands into a wide estuary, which forms the Liverpool channel, about 16 m. long, 1 to 3 m. broad; opposite Liverpool, it is a mile and a quarter in width, with considerable depth at low water. It is much obstructed by sandbanks; but an excellent system of pilotage renders the navigation comparatively secure. Entire length of the M. with its estuary, nearly 70 m. A tunnel to connect Liverpool and Birkenhead is being made beneath the estuary.

MERTHYR-TYDVIL, *mér'thér-tǐd'vīl*, W. *mér'thér-tǔd'vīl*: market-town of S. Wales, on the n. border of the county of Glamorgan, abutting on the county of Brecknock. It is surrounded by lofty hills, and is on the river Taff, 500 ft. above sea-level, 24 m. from its mouth and port at Cardiff; and it includes the junctions of the greater and lesser Taff, the Morlais, and the Dowlais, streams which here unite to constitute the main river. M. is the seat of the iron trade of Glamorgan, as represented by the great works at Dowlais, Cyfarthfa, and Plymouth, and in a less degree at Penydarren. It has also large collieries, and is famed, with Aberdare, for the excellence of its steam coal. From about 1835 the manufacture of finished iron, chiefly rails, merchant-bars, girders, and ship-plates, grew rapidly; of late, steel is very largely produced. The exports of coal are considerable, but the chief consumption is within the works. The population are directly dependent upon the iron-works, there being no other trade or manufacture. Railways branch from M. to Brecon, to Swansea, to Cardiff and Penarth, and to Newport and Hereford. Dowlais contains some fine public buildings, but M. is deficient in this respect. Though a busy place, it has not a fine appearance, having risen very rapidly with the local trade, and having attained nearly its present dimensions before it was under any but the ordinary parochial government. There are however, signals of improvement. It is well supplied with water, and the infantile mortality, long extraordinary, is now reduced. The people, chiefly Welsh, are industrious, and orderly. The place is said to take its name from the martyrdom here of a female British saint Tydvil or Tydfil. Pop. (1381) 48,861; (1891) 58,080.

MERTON COLLEGE—MERULIDÆ.

MERTON COLLEGE, *mér'ton*, OXFORD: the House of the Scholars of Merton, the model of all the secular colleges, was founded first in Maldon in Surrey by Walter de Merton, Bp. of Rochester, and Lord High Chancellor, 1264, for the maintenance of 20 scholars in the schools of Oxford, and of a warden and three or four ministers of the altar, who were to manage the property. Before 1274, he transferred his warden and ministers to Oxford—thereby not only founding his own college, but contributing in no small degree to fix the university in its present locality. The fellows were to be as many as the means of the house could maintain, and after some changes, this number was fixed by Abp. Laud at 24. They were to be elected first and chiefly from the founder's kin; but this was from an early period evaded, and the commissioners of 1852 speak of 'a common belief in the university that the elections to fellowships at Merton were formerly determined by personal interest.' In 1380, Dr. Wylliot, Chancellor of Exeter, endowed 12 *portionistæ*, or postmasters as they are now called, equivalent to the scholars of other colleges; and 1604, John Chamber, fellow of Eton, endowed two more, restricted to foundationers from Eton. By the ordinances under 17 and 18 Vict. c. 81, considerable changes were made—six fellowships were suspended, of which two were assigned to increase the postmaster-ships, etc., and four to the endowment of the Linacre professorship of physiology, of value £800 per annum. The remaining 18 were thrown open, and not to exceed £250 per annum, exclusive of rooms, until the original number of 24 was restored. The number now being completed, they have reached their limiting value of £300. Sixteen postmasterships, and four scholarships, each of the value of £80 a year, are open without restriction; two postmasterships are thrown open in default of candidates from Eton. This college possesses 18 benefices.

MERU, *mā'rû*, in Hindu Mythology: fabulous mountain in the centre of the world, 80,000 leagues high; most sacred of all mythical mountains, the abode of Vishnu, and endowed with all imaginable charms.

MERULIDÆ, *mē-rô'li-dē*, or **TURDIDÆ**, *tér'dī-dē*: family of birds of order *Insectores*, sub-order *Dentirostres*, having arched and compressed bills, which are pointed and notched, but not strongly. The species are very numerous, and very widely distributed over the globe, some in cold and some in warm climates. Some are migratory; a few species are gregarious at all seasons, many are gregarious only in winter. They generally build their nests in trees. They feed chiefly on soft animal and vegetable substances, as berries, insects, and worms. Many are birds of very sweet song; some are remarkable for their imitative powers. To this family belong thrushes (among which are reckoned the black-bird, redwing, fieldfare, ring-ouzel, etc.), orioles, mocking-birds, dippers, etc.

MESPILUS—MESS.

MES'PILUS: see MEDLAR.

MESPRISE, n. *měs-prīz'* [OF. *mespris*; F. *mépris*, contempt—from L. *minus*, less, and mid. L. *pretiārē*, to prize]: in *OE.*, contempt; scorn; misadventure.

MESQUITE' TREE: see MEZQUITE.

MESQUITE GRASS, *měs-kēt'*, Sp. *měs-kētā*: kind of pasture-grass abundant in the s.w. states; of genus *Aristida*.

MESS, n. *měs* [OF. *més*; F. *mets*, a service of meat: It. *messa*, a mess of meat—from L. *missus*, sent, in the sense of served up or dished: comp. Gael. *meas*, fruit]: a dish of food; a quantity of food prepared for a certain number of persons; a mixed mass; in the *army* and *navy*, a number of persons who eat together; the food provided for them: V. to eat together at a common table; to supply with a mess. MESS'ING, imp. MESSED, pp. *měst*. MESS'-MATE, one eating at the same table.

MESS, n. *měs* [Ger. *meischen*, to stir the malt in hot water: Gael. *measg*, to mix: OE. *mesh*, a disagreeable mixture: comp. Gael. *musach*, filthy: It. *mescolare*, to mix together]: a mixture disagreeable to the sight or taste; untidiness; disorder; a situation of distress or difficulty. *Note.*—MESS is a corruption of MESH, another form of MASH, which see.

MESS: originally a dish or portion of food; but used in the army and navy in the sense of a number or association of officers or of men taking their meals together. In societies consisting entirely of men, and of one set of men continually thrown together, it is a very important social point that the M. should be well regulated. There are consequently stringent rules—both of the service and of mutual etiquette—for its government. One officer acts as caterer, receives subscriptions from the several members, charges the wine to those who drink it, etc.; a steward has charge of the more menial department, arranging for the cooking, purchase of viands, servants, rations, etc.

In the British army, it is considered necessary for discipline that these messes should be quite exclusive, though, in the armies of continental Europe, and especially the French, the case is different, the utmost familiarity being encouraged between all ranks when off duty. The social equality of officers and men, due to conscription and promotion from the ranks, accounts for this difference of system.

Common seamen and common soldiers, in the navy and army respectively, *mess* together in tables comprising a certain number, according to their rations or squads; but this has no reference to the technical meaning of *messing* as applied to officers, and is merely for economy of fuel and labor in cooking of rations. See RATIONS.

In the United States the government has furnished the army, through the quartermaster-general, the ordinary articles of provision, but it has long been customary

MESSAGE—MESSALINA.

for sutlers to follow the army and sell various luxuries to the soldiers. The sutlers are subject to martial law and are under strict surveillance. If convicted of wrong they are severely punished. As prices have often been exorbitant and the system tends to cause extravagance on the part of the soldiers, a strong effort was made in 1888 to abolish the sutler's department and establish army canteens (see CANTEEN) for the various regiments and stations, which should be under the direct charge of government, and which should furnish places for social gatherings, and supply to the various messes refreshments at slight advance on actual cost. In 1889 this feature of messing was adopted and, except in cases in which the canteen has degenerated into a saloon, is strongly commended by officers and privates. Its good effects are apparent in the greatly improved quality of the materials furnished and the diminished cost to the purchasers.

In the navy it has long been a cause of complaint by the officers that great expense was involved in obtaining any but the most common articles of food, and especially that the cost of entertainment of visitors, of whatever rank or station, was a heavy and unjust tax on their incomes. In the navies of other countries, particularly in that of Great Britain, an allowance is made by the govt. to commanders of the larger ships to meet the expense of entertaining naval official visitors. The U. S. govt. makes no allowance of this kind, and the cost of entertaining visitors, either at home or in foreign waters, must be borne by the officers of the ships on which the receptions are given.

MESSAGE, *n.* *mēs'sāj* [F. *message*—from mid. L. *missaticūm*; OF. *messatge*, a message—from L. *missus*, sent]: any notice or communication, written or verbal, sent from one person to another; an errand; the formal official communication, as from a president to congress, a governor to a legislature, a sovereign to parliament, or from one legislative house to the other. MESSENGER, *n.* *mēs'sēn-jēr*, the bearer of a message or errand; a harbinger; in a *ship*, a cable used in weighing the anchor. *Note.*—In MESSENGER the *n* is intrusive, and thus stands for *messenger*; so *passenger* for *passager*, and *scavenger* for *scarager*.—SYN. of 'messenger': carrier; courier; forerunner; herald; precursor; intelligencer.

MESSALIANS, *a.* *mēs-sā'li-anz* [from the Syriac name, those who pray]: same as EUCHITES (q.v.).

MESSALINA, *mēs-sa-lī'na*, VALERIA: d. A.D. 48; daughter of Marcus Valerius Messala Barbatulus, and wife of the Roman emperor Claudius. She was infamous for lasciviousness, avarice, and various atrocities. Taking advantage of the weakness and stupidity of the emperor, she played the adulteress without restraint, and unrelentingly caused all to be put to death who stood in the way of her unhallowed gratifications. The best blood of Rome flowed at her pleasure. Among her vic-

MESSANA—MESSERVE.

Timis were the daughters of Germanicus and Drusus, Justus Catonius, M. Vineius, Valerius Asiaticus, and her confederate Polybius. She went so far in vice as to offer her charms for sale like a common prostitute; and at last, during a temporary absence of the emperor, she publicly married one of her favorites, C. Silius, upon which Nareissus, one of the emperor's freedmen, represented to him that M. was aiming at his destruction, and received orders that she should be put to death. This sentence was executed by Enodus, a tribune of the guards, in the gardens of Lucullus. Her name has become a by-word for lust and crime.

MESSANA: see MESSINA.

MESSAPIA, *mēs-sā'pī-a*: Greek name for the Roman Calabria, peninsula in s.e. Italy: see CALABRIA: BRUTTIUM.

MESSENGERS, KING'S (QUEEN'S): officers employed by British secretaries of state to convey dispatches at home and abroad. In former days, their occupation consisted, to a considerable extent, in serving the secretaries' warrants for apprehension of persons accused of high treason and other grave offenses against the state; frequently they kept the prisoners whom they apprehended at their own houses. They are now employed principally in foreign service.

MESSENGERS-AT-ARMS, in Scotland: officers who execute the process and letters of the courts of session and justiciary. They number at present about 100, and are appointed by, and are under the control of, the Lyon King-at-Arms (q.v.).

MESSENIA, *mēs-sē'nī-a*: district in the s.w. of the Peloponnesus, bounded e. by Laconia, n. by Arcadia and Elis, and s. and w. by the sea. It was composed chiefly of extensive plains, watered by the *Pamisos* and other streams. Those plains were famous for fertility, particularly for their wheat-harvests. At an early period, after the Doric conquest, M. rose to power and opulence. Its chief cities were Messene, Methone, and Pylos. It is noted chiefly for its two wars with Sparta, known as the Messenian Wars: the first (according to the common chronology) B.C. 743 to 724; the second B.C. 685 to 668. In both wars the Messenians were defeated, and, in consequence, a great part of them emigrated to Sicily, where they took possession of Zancle, which then received the name of Messina, the present Messina. After 300 years, Epaminondas invited their descendants back to Greece, and they joyfully responded to his invitation. —M. is the name of one of the *nomarchies* of the modern kingdom of Greece.

MESSERVE, NATHANIEL: soldier and ship-builder: b. Portsmouth, N. H.; died 1758, June. He was lieutenant-col. of the regt., under Col. Moore, which in 1744-5 New Hampshire furnished to aid in the siege of Louisburg, on the coast of Nova Scotia, from which point expedi-

MESSIAH.

tions had been sent to prey upon the commercial and fishing interests of the colonies. M. was the trusted and valiant leader of the N. H. soldiers in the defense of Fort Edward and the attack on Crown Point. In 1758 he started with the second expedition against Louisburg, but before reaching the scene of operations was stricken with small-pox and died. His son, GEORGE, held various govt. offices in N. H. and Mass., refused to join the patriots in their struggle for independence, and in 1777 sailed for England.

MESSIAH, n. *mēs-sī'ă* [Heb. *mashiach*, anointed—from *mashach*, to anoint]: Christ, the Anointed; the Savior. MESSIAHSHIP, n. the office of the Messiah. MESSIANIC, a. *mēs'sī-ăn'ik*, pertaining to the Messiah. MESSIAS, n. *mēs-sī'ăs*, the Messiah.—*Messiah*, equivalent to the Greek *Christos*, the Anointed, designates, in the Old Testament, the mighty leader, deliverer, and Savior, the promised One from God—of whose coming the Hebrew nation was expectant through many ages. In the later Jewish history, when the nation was bowed under a foreign and heathen yoke, the Messiah was looked and longed for, not only to restore their country to the power and splendor of the days of David and Solomon, but even, by compelling the Gentiles to acknowledge the supremacy of the theocratic people, to raise it to the summit of universal dominion. The oldest biblical records in their Messianic indications refer rather to the high degree of prosperity which the chosen people were to expect *for themselves* under Messiah's reign. This expectation, already visible in the Abrahamidæ, appeared as for a moment to have realized itself in the conquest of Canaan; but the subsequent, often disastrous wars (in the period of the 'Judges' and of Saul), as well as the internal feuds and dissensions of the Hebrews themselves, left it in fact unfulfilled. Nevertheless, the hope of the appearance of the M. had rooted itself strongly in the people, and, during the glorious and peaceful reigns of David and Solomon, had so grown and enlarged, that even after the secession of Israel from Judah, and during the momentous ages that elapsed until the destruction of the Jewish kingdom, it was confidently expected that God would raise up a 'branch from the stem of David' as the M., the founder of the national prosperity, and the bringer-in of the all-embracing theocratic sovereignty. That branch was declared to be 'the anointed of the Lord,' and, since David applied that epithet to himself, the Jews transferred it to the deliverer whom they expected, and called him 'Son of David.' The prophetic writings contain many such allusions to the M., whose coming was expected shortly, and even during the time of the generation then living, whose birthplace, in congruity with his Davidic descent, was announced to be Bethlehem, and who, it was believed, was to be endowed with the attributes of God. These prophetic allusions are commonly termed MESSIANIC PROPHECIES. Together with such expectations the proph-

ets associated the idea of a forerunner (Elijah, Jeremiah, or Moses), whose function was to prepare the people for the appearance of the M. The coming of the Messianic kingdom was to be preceded by a period of severe misfortune and bitter sorrows, the purpose of which was the reconciliation of the people with God (Is. i. 25, etc.; Joel iii.; Dan. ix.; Zech. xiii.). These sorrows are called the woes of the M.: they are minutely described in the second book of Esdras—an apocryphal work. Hence sprang up and became diffused among the Jews the idea of a suffering M., who, by enduring grief and shame, should make atonement for the people, and reconcile them with God. This conception was greatly strengthened by the picture in Isaiah (lii. and liii.) of a ‘servant of God,’ which, in fact, is generally regarded as the most distinct prophecy of the Savior. Hence the step further of considering the M. an offering and sacrifice for the sins of the people, was an easy one; yet, on the other hand, the step seems not to have been taken by the nation at large, who were dazzled by the expected glory, so that their eyes failed to see their M. as the ‘Man of Sorrows’ so wondrously portrayed by Isaiah. It is singular that no trace of this part of the prophetic view is found in the Apocrypha. The popular belief of the Jews was that the M. was to live forever (Jn. xii. 34); therefore a crucified Savior was a stumbling-block to them (I Cor. i. 23), and even the disciples of the Lord Jesus did not comprehend his allusions to his death, and their faith in him as the M. was long dim and doubtful. In fact, this popular form of the Messianic belief of the Jews—accordant with their national pride as God’s chosen people—was the very reason why they failed to recognize Jesus as the Messiah. In the later Judaism (as it shows itself in the Talmud), the conceptions of the M. are rich in singularities. It was believed that the *true* M., the son of David, would be preceded by another M., a son of the patriarch Joseph, or Ephraim, who should suffer death for men as a sin-offering. Century after century, the Jews have expected the glorious M.; and repeatedly have they risen and placed themselves under the standard of dreamers, fanatics, and impostors, who took to themselves the sacred name; e.g., BAR-COCHBA (q.v.) in the 2d c.; one Moses in the Isle of Candia in the 5th c.; one Julian in Palestine in the 6th c.; several in Persia, and Arabia in the 12th c.; and, as late as the 18th c., Sabatai Zevi, in Aleppo. Even yet, the hope of a M. is not dead in the hearts of the strict Talmudistic Jews.

The *crucial* question of theology, however, is not the form in which the doctrine of the M. was held by the Jews. All rational students of Scripture, whether ‘orthodox’ or ‘heterodox,’ now admit that its growth was gradual, and that it acquired precision and definiteness of outline in the course of ages, from its first rude phase, among the pastoral princes of the Syrian wilderness, down to that sublime, yet shadowy personality—the

Man of Sorrows—that continually recurs to the vision of Isaiah. The grand question is: Was this doctrine essentially a Divine inspiration, an objective truth of God, or only a lofty conception of the religious soul? The rationalistic theologians maintain—and endeavor to prove by analytic examination of the Gospels—that Jesus assumed the dignity of M. to accommodate himself to a rooted conception of his countrymen, and partly because he himself believed it—a conclusion, it is said, at which he might arrive quite honestly, since he felt that the spiritual *truth* which he brought to men was the real and only power of the ‘kingdom of God,’ and that therefore he was justified in applying to himself all that was said (tropically) by the prophetic poets in times of old concerning him who should usher in this ‘golden age’ of the world’s faith. The great mass of orthodox theologians, on the other hand, accepting the New Testament as presenting the simple truth concerning the Lord Jesus, and regarding the so-called Messianic prophecies of the Old Testament as positive, divinely suggested (perhaps, even on the part of their authors, *conscious*) predictions of Jesus Christ, repudiate the principle of accommodation, or even spiritual application, and try to show that the Savior accepted the Messianic prophecies as literally and exclusively applicable to him. The historico-spiritual school, represented in Germany by men like Neander, Rothe, Tholuck, etc.—and in England and America, generally speaking, by the divines of the ‘Broad Church’ party—occupy a middle position, yet not so strictly a compromise between, as a combination of, these two extremes: with the rationalists, they hold that the Old Testament doctrine of the M. was gradually developed, contains many human elements, and might not necessarily have implied a knowledge of the historical Jesus on the part of those who announce it; with the ‘orthodox,’ on the other hand, they assert that the doctrine is the expression of a fact, not of a sentiment—that Jesus of Nazareth was actually the Son of God, the appointed M., and that in him the so-called Messianic prophecies were fulfilled in a far higher sense than ever the prophets could have dreamed. It will thus be seen that the rationalists resolve the doctrine of the M. into a merely *subjective* religious idea; while the orthodox and the historico-spiritual school hold that the doctrine was the expression of a Divine fact—the *substance* of a heavenly faith.

MESSIEURS, n. plu. *mēs'yèrz* [F. plu. of *monsieur*]: sirs; gentlemen; contracted MESSRS. *mēs'èrz*, which is used as the plu. of Mr.; put before the designations of firms or commercial houses that conduct their business under more than one name, when speaking of them or addressing them by letter, as *Messrs.* Wm. Blackwood & Sons, *Messrs.* T. B. Campbell & Co.: see MASTER.

MESSINA, *mēs-sē'nâ*: province in n.e. Sicily, separated from the mainland of Italy by the Strait of M.—a separation attributed to an earthquake before the historic period. The province includes the Lipari Islands; its Sicilian coast is on the Ionian Sea; and Mt. Etna marks its s.w. boundary. Area, 1,768 sq. m. Pop. (1901) 543,809. See SICILY.

MESSINA: city of Sicily, chief town of the province of M.; one of the most ancient and most important cities of the island; charmingly situated on the Strait of M., encircled by a zone of abrupt conical rocks, commanding a view of Calabria. The town is inclosed by old walls, and has several fine squares and wide lava-paved streets. The harbor, formed by a projecting tongue of land curved in the form of a sickle (whence its primitive name, Zancle—Gr. sickle: see MESSENIA), is about 4 m. in circumference, and can contain a thousand ships; it is defended by a citadel and six forts; the depth is sufficient to admit vessels of large size; and the quays are spacious. The trade of M., chiefly in silk, oil, wine, coral, fruits, linseed, fish, etc., though less extensive than formerly, is still an important source of wealth to Sicily. The chief imports are cotton and woolen manufactures, hardwares, and other colonial products. The damasks and satins of M. are excellent, and the fisheries important. M. has steam-boat communication with Naples, Marseille, and Malta. In the 15th c., M. was a renowned seat of learning; and in the 16th c., a famous school of painting was founded there by Pelidoro da Caravaggio. In modern times, it has undergone terrible vicissitudes, having been ruthlessly bombarded by the royal forces on several occasions during the war of independence 1848. Pop. (1901) 149,778.

MESSINA, STRAIT OF [It. *Faro di Messina*, Lat. *Mamertinum fretum*]: between Italy and Sicily, 22 m. in length, and $2\frac{1}{2}$ to 10 m. wide. A strong current runs through the strait, which is of great depth. See SCYLLA AND CHARYBDIS.

MESSUAGE, n. *mēs'swāj* [OF. *mesuage*—from mid. L. *mesuāgiūm*, a manor-house—from L. *mansus*, a residence—from *manēō*, I remain, I abide]: in law, a dwelling-house and offices, with the land attached; a tenement.

MESTEE, n. *mēs'tē*, or MUSTEE, n. *mūs'tē* [Sp. *mestizo*, mongrel: see next entry]: in the W. I., a person of mixed breed; offspring of a white and a quadroon.

MESTIZO, n. *mēs-tē'zō*, also MESTINO [Sp. *mestizo*; OF. *mestis*, of a mixed race—from L. *mixtus*, mixed]: in Mexico, Central and S. America, the offspring of a Spaniard, or a creole, and a native Indian. The fem. form is MESTIZA. The offspring of an Indian father and a mestiza is called *mestizo-claro*; of a mulatto and mestiza, a *chino*; of a negro and mestiza, a *mulatto-oscuro*.

MESTRE—METAGENESIS.

MESTRE, *měs'trā*: town of n. Italy, province of Venice, 5 m. n.w. of the city of Venice, on the margin of a lagoon. There are many villas around the town, which has a considerable transit-trade. Pop. 4,500.

MET, pt. and pp. of **MEET**: see **MEET** 2.

META, *mět'ă* [Gr.]: a prefix in words of Greek origin, meaning beyond; after; over; a change or transference.

METABASIS, n. *mě-tăb'ă-sīs* [Gr. *metabăsis*, a transition—from *meta*, beyond; *baino*, I go]: in *rhet.*, a passing from one thing to another; transition.

METABOLA, n. *mē-tăb'ō-la* [Gr. *metabolē*, change—from *meta*, beyond; *bole*, a casting]: a change of some sort, as of air, time, or disease.

METABOLIC, a. *mět'ă-ből'ik* [Gr. *metăbölē*, change—from *meta*, beyond; *ballō*, I throw]: pertaining to change or affinity; applied to chemical changes occurring in living bodies. **METABOLISM**, n. *mě-tăb'o-lizm*, the process of change which food-stuffs undergo in the body. **METABOLIC FORCE**, vital affinity.

METABOLISM, n. *mě-tăb'o-lizm* [Ger. *metabolismus*]: in *theol.*, a term coined by Rückert to describe the doctrinal views of Ignatius, Justin, and Irenæus on the Lord's Supper. They stand midway between transubstantiation and the merely symbolical view, and hold fast to an objective union of the sensible with the supersensible.

METACARPAL, a. *mět'ă-kăr'păl* [Gr. *meta*, beyond; *karpos*, the wrist]: pertaining to the part of the hand between the wrist and the fingers. **METACARPUS**, n. *-kăr'pūs*, the long bones of the palm of the hand.

METACENTRE, n. *mět'ă-sěn'tér* [Gr. *meta*, beyond; *kentron*, the centre]: a certain point in a floating body, on the position of which the stability of the body depends: see **HYDROSTATICS**.

METACETONE, n. *mě-tăs'ě-tôn* [Gr. *meta*, change, and Eng. *acetone*]: a colorless liquid of a pleasant odor, obtained by distilling a mixture of sugar or starch and quicklime.

METACHRONISM, n. *mě-tăk'rôn-izm* [Gr. *meta*, beyond; *chronos*, time]: an error in chronology by placing an event after its real time.

METAGE, n. *mětătj* [from **METE**, which see]: measurement of coal; the price of measuring.

METAGENESIS, n. *mět'ă-jěn'ě-sīs* [Gr. *meta*, beyond; *genēsis*, a beginning]: the changes of form which the representative of a species undergoes in passing, by a series of successively generated individuals, from the egg to the perfect or imago state; the succession of individuals which present the same form only at every alternate generation; alternate generation. **METAGENETIC**, a. *mět'ă-jě-nět'ik*, pertaining to metagenesis; referring to the production of changes in a species after its first origin, as it goes on to a more perfect state.

METAGRAMMATISM, n. *mět'ă-grăm'mă-tizm* [Gr. *meta*, beyond; *gramma*, a letter]: the change or transposition of the letters of a name into such a position as to express sense in relation to the person named; also called *anagrammatism*.

METAGRAPHY, a. *mē-tăg'ră-fî* [Gr. *meta*, beyond, change; *grapho*, I write]: the art or act of rendering the letters of the alphabet of one language into the possible equivalents of another, so as to express the words of the one by the letters of the other as nearly as possible, as, expressing Hebrew characters by English letters; transliteration. **METAGRAPHIC**, a. *mět'ă-grăf'îk*, of or pertaining to.

METAGUMMIC ACID, n. *mět'ă-gŭm'mîk* [Gr. *meta*, change, and Eng. *gum*]: dried *gummic acid*, which does not again dissolve in water, but forms only a jelly with it.

METAL, n. *mět'ăl* [F. *métal*, a metal—from L. *metal-lum*; Gr. *metal'lon*, a mine whence metals are dug, a metal—*lit.*, any hard stuff or material out of a mine]: a body, such as gold, silver, copper, iron, etc., distinguished by its lustre, its opacity, its conductivity of heat and electricity, its fusibility, etc. (see **METALLURGY: METALS—METALLOIDS**); broken stones used for roads; broken glass for the melting-pot. In *her.*, the 'metals' in use are gold and silver, known as *or* and *argent*. The field of the escutcheon and the charges which it bears may be of metal as well as of color: and it is a rule of blazon that metal should not be placed on metal, nor color on color: V. to cover, as a road, with broken stones; to make up or mend a road with broken stones. **METALLING**, imp.: N. *mět'ăl-ing*, the act of forming the surface of a road with broken stones. **METALLED**, a. *mět'ăld*, covered or laid over with broken stones, as a public road. **METALLIC**, a. *mě-tăl'îk*, pertaining to metals; like a metal; consisting of metal. **MET'ALLIZE**, v. *-îz*, to render metallic; to cover or impregnate with metal. **MET'ALLIZING**, imp. **MET'ALLIZED**, pp. *-îzd*. **METALLIZATION**, n. *mět'ăl-lî-ză'shŭn*, the process of forming into a metal. **METALLIST**, n. *mět'ăl-îst*, a worker in metal. **METALS**, n. plu. the rails on the permanent way of a railway. **MET'ALINE**, n. *-în*, metallic compound used instead of oil or grease as a lubricant for machinery; invented 1870. **METAL-REFINER**, a smelter of ores; one who separates copper, lead, or other metal, from the dross or refuse with which it is mixed. **THE PERFECT OR NOBLE METALS**, those which are not easily oxidized, as platinum, gold, and silver. **THE BASE OR IMPERFECT METALS**, those which readily combine with oxygen, as iron, lead, copper, tin, and zinc. **MUNTZ METAL**, *mŭnts* [after the inventor]: an alloy made into sheets, used for sheathing ships and for other purposes, consisting of 50 per cent. of copper, 41 of zinc, and 4 of lead; also said to be 60 parts of copper and 40 of zinc. **METALLIC CURRENCY**, the coins forming the circulating medium of a

METAL—METALLURGY.

country. WHITE METAL, German or nickel silver. ROAD-METAL, broken stones of the very hardest kind, as trap or greenstone. *Note*.—There can be no doubt that the primary sense of METAL is a hard stuff or material dug from a mine or quarry, which is still the sense in common and popular usage. Including those popularly known as such, chemists enumerate about 53 metals: for a list of metals, see ELEMENT (Metallic): METALS—METALLOIDS.

METAL: see METTLE.

METALEPSIS, n. *mět'ă-lěp'sis* [Gr. *meta*, beyond; *lepsis*, a receiving or taking]: in *rhet.*, the union of two or more figures of speech of different kinds in the same word. MET'ALEP'TIC, a. *-lěp'tik*, or MET'ALEP'TICAL, a. *-tī-kăl*, pertaining to a metalepsis; transverse; transposed. MET'ALEP'TICALLY, ad. *-kăl-ī*.

METALLIFEROUS, a. *mět'ăl-īf'ēr-ūs* [L. *metallum*, a metal; *fero*, I produce]: producing or yielding metals, as strata or districts.

METALLIFORM, a. *mě-tăl'ī-fawrm* [L. *metallum*, a metal; *forma*, shape]: in the form of metals; like metal.

METALLINE, a. *mět'ăl-īn* [L. *metallum*, metal (see METAL)]: consisting of metal; impregnated with metal.

METALLOCHROMES, n. plu. *mě-tăl'lō-krōmz* [Gr. *metallon*, a mine whence metals are dug; *chroma*, color]: the beautiful prismatic tints produced by depositing a film of peroxide of lead on polished steel by electrolytic action.

METALLOGRAPHY, n. *mět'ăl-ōg'ră-fī* [Gr. *metallon*, a mine; *grapho*, I write]: a treatise on metals or metallic substances.

METALLOID, n. *mět'ăl-oyd* [Gr. *metallon*, a mine; *eidos*, a form]: a term applied to the non-metallic inflammable bodies, as sulphur, phosphorus, etc.; also applied to all the non-metallic elements (see METALS—METALLOIDS). MET'ALLOID, a., or MET'ALLOID'AL, a. *-oyd'ăl*, having the form or appearance of a metal.

METALLURGY, n. *mět'ăl-ēr'jī* [OF. *metallurgie*, a search for metal—from Gr. *metallourgos*, mining, working in metals—from *metallon*, a mine, a metal; *ergon*, work]: the art of obtaining metals from their ores; the art of working metals. MET'ALLUR'GIC, a. *-ēr'jīk*, pertaining to the art of working metals. MET'ALLUR'GIST, n. *-jīst*, one whose occupation is to work in metals.

METALLURGY: art of extracting metals from their ores. The operations are partly mechanical and partly chemical. Those processes which depend principally on chemical reactions for their results have reference chiefly to the roasting and smelting of ores: see titles of the different metals. But there are certain preliminary operations of a mechanical kind which metallie ores undergo, such as crushing, jigging, washing, etc., which are here described, as they are essentially the same for the ores of lead, copper, tin, and zinc, and indeed most of the metals. (For IRON, see that title.)

Ores are first broken with hammers into pieces of convenient size for crushing or stamping. Waste materials, such as pieces of rock, spar, etc., which always accompany ore, are as far as possible picked out by hand, and the ore itself is arranged in sorts according to its purity. Various kinds of apparatus, such as riddles, sieves, etc., are then used for separating it into different sizes, to secure a uniform strain on the crushing machinery.

Figs. 1 and 2 represent one of the most approved forms of a crushing-mill. The ore is raised in small wagons, *a*, to the platform *b*, where it is ready to be supplied to the crushing-rollers *r* through the opening *c*. These rollers are mounted in a strong iron frame, held together by wrought-iron bars, and bolted to strong beams. Their distance apart is regulated by the lever *d*, to which a weight *e* is attached. The bearings of the rollers slide in grooves, so that, when any extra pressure is put upon them by a large or hard piece of ore, the

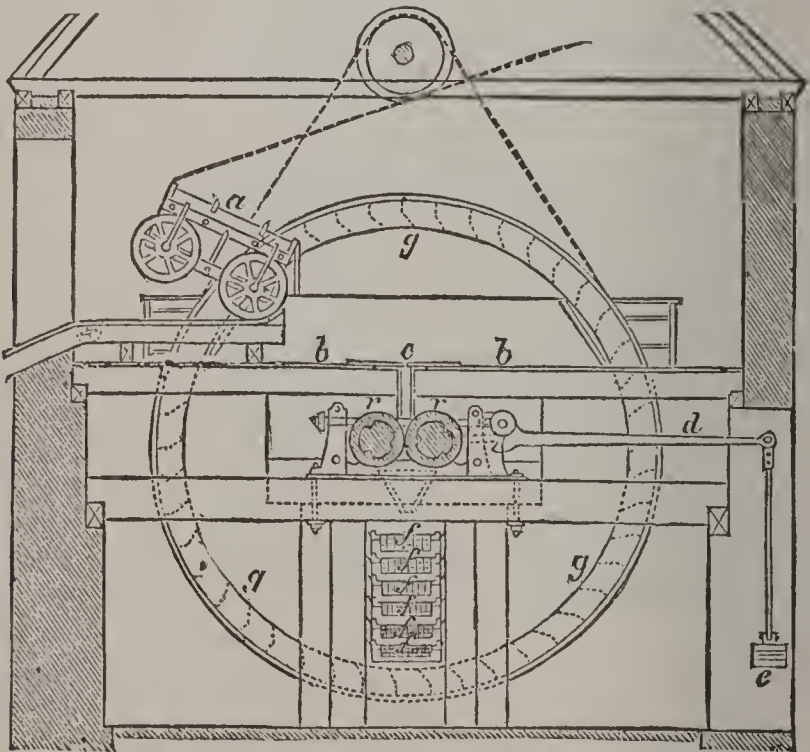


Fig. 1.—Ore Mill :

End view of the crushing-rollers, sieves, and bucket-wheel.

lever rises, and allows the space between the rollers to widen. The crushed ore falls upon a series of sieves, *f*, which are made to vibrate. These have meshes increas-

METALLURGY.

ing in fineness as they descend; and the upper two are so wide that pieces of ore too large to pass through them

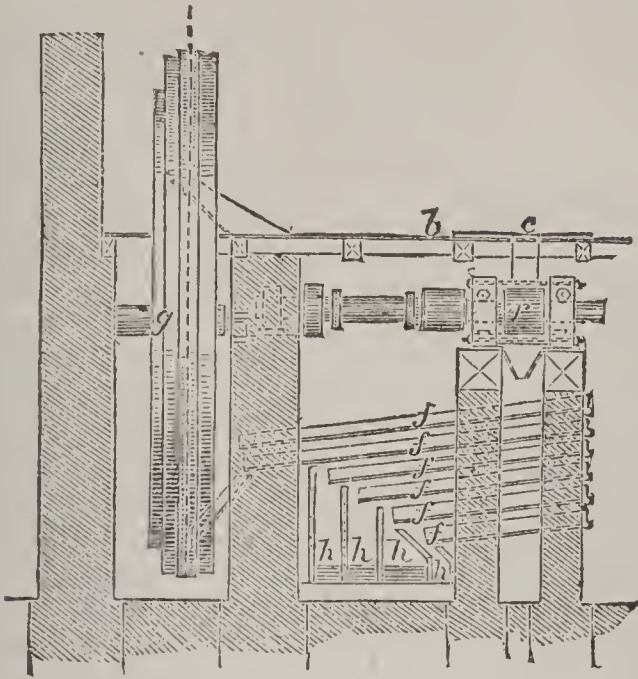


Fig. 2.—Ore Mill:

Side view of the crushing-rollers, sieves, and bucket-wheel.

are conducted into the lower part of the bucket-wheel *g*, and raised again to the platform, to be recrushed. The lower four sieves separate the remaining portion of the crushed ore into different degrees of fineness, and it is collected in the pits *h*.

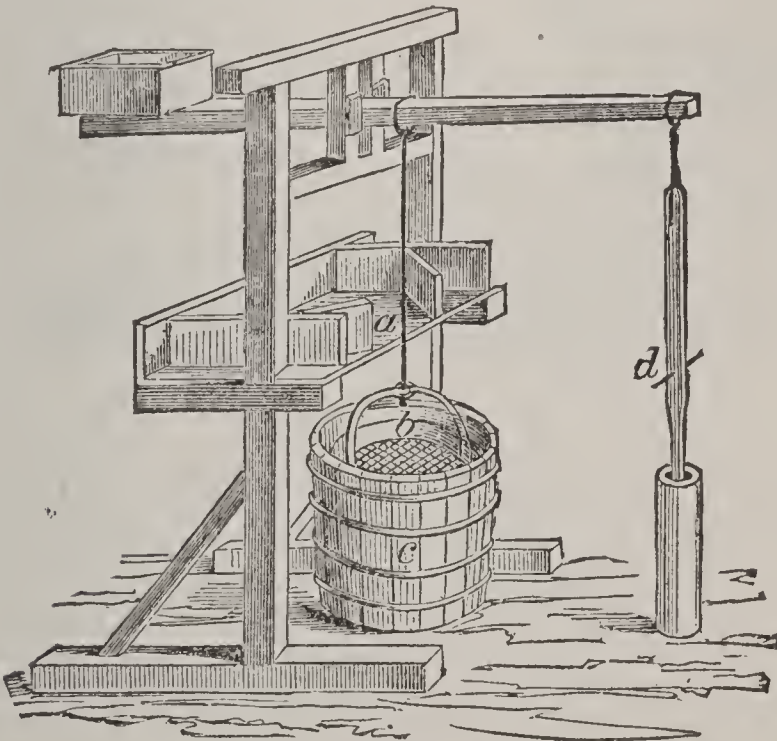


Fig. 3.—Jigging-sieve.

Instead of crushing-rollers, sometimes a stamping-mill is used, especially for tin ores, which require to be reduced to fine powder. The stamping-mill consists of a series of upright shafts with a weighty piece of iron at

the bottom of each. They are raised by means of an axle with projecting cams, and then, falling by their own weight, act like hammers.

After being crushed the ore is washed and sifted on a jigging-sieve. One of the simplest forms is shown in fig. 3. The ore is placed on the table *a*, from which the sieve *b* is filled. It is then immersed in a tub of water *c*, and a jigging motion communicated to it by a workman alternately raising and lowering the handle *d*. This effects two purposes—it washes the ore, and it separates the material into two layers: the upper consists of the lighter spar and other impurities, which are raked off; and the lower consists of the heavier and purer portions of the ore, which are now ready for the roasting furnace.

It will be apparent that in the bottom of the tub there must be a quantity of more or less valuable ore, which, from its fineness, has fallen through the sieve. This is called sludge or slime; and the minute particles of ore that it contains are recovered either by simply forming an incline on the ground, and washing it with a current of water, or by using an inclined table, such as is shown in fig. 4, called a *sleeping-table*. Ore which has been reduced to powder at the stamping-mill, as well as slime, is washed by this apparatus. The material is put into the chest *a*, which is placed in a sloping position, and is supplied with water on turning the stop-cock *b*. The current carries the contents of the chest through the opening at the bottom, and spreads it, with the aid of

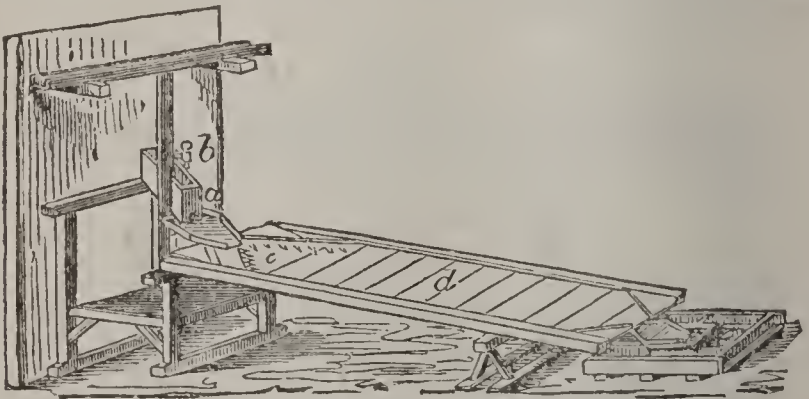


Fig. 4.—Sleeping-table.

a series of stops, or small bits of wood, *c*, over the surface of the table *d*. A stream of water is then kept flowing over the table till all the earthy impurities are carried down into the trough *e*, the pure particles of the ore remaining, by reason of their greater specific gravity, near the top of the table, whence they are removed to be smelted. Sometimes the table is suspended by chains, and receives a succession of blows at the top from a *buffer*, moved by cams on the same principle as the stamping-mill. This arrangement is found of great advantage in dressing very poor ores.

The variety of machinery and apparatus used in dressing ores is very great, and they pass under different names, but they all are very similar in principle.

METALS—METALLOIDS.

METALS—METALLOIDS: in chemistry, the two great divisions of all the known elements (see **ELEMENT**).—For each metal, see its title. Various points regarding the general physical and chemical characters of these bodies and the method of classifying them are here noticed.

It is not easy to define a metal. All the *elements* are usually divided by chemists into two groups—viz., the non-metallic bodies, or *metalloids*, and the *metals*; the list of non-metallic bodies comprising all those elements in which the characteristic properties of the bodies popularly known as metals (such as silver, gold, iron, etc.) are wanting; these characteristic properties being their metallic lustre, their opacity, and their capacity of conducting heat and electricity. The non-metallic elements (metalloids) are 14 in number—oxygen, hydrogen, nitrogen, sulphur, selenium, tellurium, phosphorus, chlorine, bromine, iodine, fluorine, carbon, boron, and silicon; of which five are gases, one is a liquid, and the rest are solids at ordinary temperatures.

The division of the elements into these two great groups is, however, not based on any definite scientific grounds, and it is still an open question whether some of the metalloids, e.g., tellurium and silicon, should not be placed among the metals. The non-metallic bodies or metalloids being remarkable as a group for only their negative properties, require no special consideration: we turn to the general properties of the metals.

The following are the most important *physical* properties of the metals:

1. All metals, unless in a finely pulverized form, exhibit more or less of the characteristic lustre termed metallic. Two of the non-metallic elements, iodine and carbon, in some forms, also present a metallic lustre.
2. All metals are good conductors of heat and electricity, though in very unequal degrees.
3. With the exception of mercury, all the metals are solid at ordinary temperatures. With the exception of gold, copper, calcium, and strontium, the metals are more or less white, with a tendency to blue or gray. Most of them have been obtained in crystals, and probably all of them are capable of crystallizing under certain conditions.
4. Metals are remarkable for opacity, and, with the exception of gold, do not transmit light, even when they are reduced to extremely thin leaves.
5. All the metals are fusible, though the temperatures at which they assume the fluid form are very different (see **FUSING AND FREEZING POINTS**); and some of them, e.g., mercury, arsenic, cadmium, zinc, are also volatile.
6. Great weight, or a high specific gravity, is popularly but erroneously regarded as characteristic of a metal; while platinum, osmium, and iridium (the heaviest bodies known in nature) are more than 20 times as heavy as water, lithium, potassium, and sodium are actually lighter than water.
7. Great differences are observable in the hardness, brittleness, and tenacity of metals. While potassium and sodium may be kneaded

METALS—METALLOIDS.

with the finger, and lead may be marked by the fingernail, most of them possess considerable hardness. Antimony, arsenic, and bismuth are so brittle that they may be easily pulverized in a mortar; while others, e.g., iron, gold, silver, and copper, require great force for their disintegration. Taking iron and lead as representing the two extremes of tenacity, it is found that an iron wire will bear a weight 26 times as heavy as a leaden wire of the same diameter: see DUCTILITY: MALLEABILITY. 8. It is a remarkable property of the metals that none of them are capable of being dissolved without undergoing chemical change. Sulphur, phosphorus, iodine, etc., may be dissolved, and after the evaporation of the solvent may be re-obtained with all their original properties; but this is never the case with metals.

Among the chief *chemical* properties of metals are the following:

Their strong affinities to some of the non-metallic elements. All the metals, without exception, combine with oxygen, sulphur, and chlorine, and often in several proportions, forming oxides, sulphides (formerly termed sulphurets), and chlorides. Many of them combine with bromine, iodine, and fluorine. The other compounds of this nature, excepting carbide (formerly carburet) of iron, or steel, and the hydrides of arsenic and antimony (commonly known as arseniuretted and antimonuretted hydrogen), important in toxicology, may be passed over without notice.

The metallic oxides are, without exception, solid bodies, insoluble in water, and usually present a white or colored earthy appearance. Hence the old name of *metallic calx* for these oxides.

Those oxides which are termed basic possess the property of directly uniting with the so-called oxyacids (such as sulphuric, nitric, carbonic, and silicic acid), and of forming a new chemical compound of the second order, termed a *Salt* (q.v.).

The compounds of the metals with chlorine, iodine, bromine, and fluorine, such, for instance, as chloride of sodium, or common salt (ClNa), are termed Haloid Salts (q.v.). The same metal may often combine both with chlorine and with oxygen in more than one proportion—e.g., subchloride of mercury (Hg_2Cl); suboxide of mercury (Hg_2O); chloride of mercury (HgCl); oxide of mercury (HgO). For the compounds of the metals with sulphur, see SULPHIDES OF THE METALS.

Metals enter into combination with one another when they are fused together, and such combinations are termed *Alloys* (q.v.), unless when mercury is one of the combining metals, in which case the resulting compound is termed an *amalgam*. It is doubtful whether all alloys are true chemical compounds. Definite compounds of the metals with each other do, however, certainly exist, and are sometimes found native—e.g., the crystallized silver and mercury compound represented by the formula AgHg_2 .

METAMERIC.

In consequence of their strong affinities for the metalloids, the metals are seldom found in a free or uncombined state, even in the inorganic kingdom, and never in animals or plants. The more common metals, in consequence of their strong affinity for oxygen and sulphur, are very rarely found in the uncombined state; but some of the less abundant, e.g., gold, silver, and platinum, are found uncombined, in which case the terms *native* and *virgin* are applied to them; and other metals, as mercury and copper, occur both in a free and in a combined state. Many native alloys are found, but the ordinary sources of the metals are oxides, sulphides, chlorides, and carbonates, sulphates, and other salts. These are termed the *ores* of the metals. For methods of obtaining the metals from their various ores, see METALLURGY: ELECTRIC SMELTING.

Various classifications of the metals have been suggested by different chemists. The following is probably one of the most convenient:

I.—The *Light Metals*, subdivided into—

1. The metals of the alkalis—viz., potassium, sodium, cesium, rubidium, lithium.

2. The metals of the alkaline earths—viz., barium, strontium, calcium, magnesium.

3. The metals of the true earths—viz., aluminium, glucinum, zirconium, yttrium, erbium, terbium, thorium, cerium, lanthanum, didymium.

II.—The *Heavy Metals*, subdivided into—

1. Metals whose oxides form powerful bases—viz., iron, manganese, chromium, nickel, cobalt, zinc, cadmium, lead, bismuth, copper, uranium, thallium.

2. Metals whose oxides form weak bases or acids—viz., arsenic, antimony, titanium, tantalum, niobium (or columbium), tungsten, molybdenum, tin, vanadium, osmium.

3. Metals whose oxides are reduced by heat—noble metals—viz., mercury, silver, gold, platinum, palladium, iridium, ruthenium, rhodium, osmium. Several of the rare metals are omitted from this list: see ELEMENT (Metallie).

Another classification is that by which the M. are arranged in six groups, each group named after a metal which possesses the common characters in a well-marked degree: viz., (1) the sodium group; (2) the calcium; (3) the iron; (4) the copper; (5) the platinum; and (6) the antimony groups.

METAMERIC, a. *mēt'ă-mēr'ik* [Gr. *meta*, change; *meros*, a part]: in *chem.*, having different characters and properties, but the same ultimate elements and molecular weight with another body.

METAMORPHIC ROCKS.

METAMORPHIC ROCKS: rocks transformed by some indurating agency after they had been deposited. Few of the deposits forming the crust of the earth remain in the condition in which they were deposited. By infiltration of a cementing fluid, by pressure, or by some other indurating agency, sand has become converted into sandstone, and clay and mud into shale. In some strata, this operation has been carried still further. There is a class of rocks, including gneiss, mica-schist, clay-slate, marble, and the like, which, while certainly of aqueous or mechanical origin, have, by intense molecular action, become more or less crystalline. To them, the convenient name M. R. has been given by Lyell.

The M. R. were formerly considered the fundamental strata of the earth's crust. The original incandescent mass, it was said, losing its heat by radiation, a solid uneven crust of granite was formed. As soon as the ordinary atmospheric and aqueous agencies began to operate, a disintegration took place, and the abraded materials, carried down by the waters, were deposited in the basins which contained the boiling sea. It was thought that this not only accounted for the condition in which the M. R. now exist, but for the remarkable undulations and contortions characteristic of these strata. Gneiss and the allied crystalline schists were accordingly placed as the lowest sedimentary strata in a division equivalent to the Paleozoic Period, and called the Azoic, because they were destitute of organic remains, the conditions in which they were formed being opposed to the existence of animals.

It is now, however, known that M. R. occur as contemporaneous deposits in all epochs of the earth's geological history. In Canada and in the Hebrides, they are of Laurentian age; in the Highlands of Scotland, Cambrian and Silurian; in Devon and Cornwall, Old Red Sandstone and Carboniferous; and in the Alps, Oolitic and Cretaceous, and in some parts even Tertiary. Although deposits of such various ages have been thus altered, the resulting rocks are in structure and composition very similar; their ultimate constituents do not differ from those of ordinary clays and sandstones. In all of them, silica forms the largest proportion, 60 to 70 per cent.; alumina follows next, and then other substances in smaller quantities—lime, soda, potash, iron, etc. This similarity of composition, and the abundance of clays and sandstones, suggests the supposition that the M. R. may be nothing more than these deposits greatly altered; this is confirmed by many observed instances in which aqueous strata are continuous with and gradually change into M. R. The granite of Dartmoor, England, has intruded itself into the slate and slaty sandstone, twisting and contorting the strata. Hence some of the slate rocks have become micaceous; others more indurated, having the characters of mica-slate and gneiss; while others, again, appear converted into a hard-zoned rock, strongly impregnated with felspar. In some

METAMORPHIC ROCKS.

places in the Eastern Pyrenees, the chalky limestone becomes crystalline and saccharoid as it approaches the granite, and loses all trace of the fossils which it elsewhere contains in abundance. These illustrations tell of changes occurring in the proximity of granite, and it has been consequently somewhat hastily concluded that this rock, coming up in a molten condition from below, has, by the radiation of its heat, produced the metamorphosis. But the observed stratigraphical position of granite, its sometimes passing by insensible degrees into gneiss, and the experiments of Solly and Bryson on its internal structure, show without doubt that this rock is, at least in many places, an extreme result of metamorphic action, and not the cause of it. To call the energy producing these results metamorphic or molecular action, is simply to hide our ignorance—we get a name, but nothing more. To speak dogmatically on a subject so obscure, is a sign of the same ignorance. The following, however, are the most probable agents that, together or separately, produced these remarkable changes:

1. *Heat*.—From whatever source derived, heat does exist, either distributed universally, or occurring locally in the mass of the earth; and where it exists, thermo-electric influences induce action, which, carried on over immense series of years, might produce in the end great changes. It was by some maintained that granite is the result of crystallization from perfect fusion, and that the strata converted into gneiss must have been reduced to a state of semi-fusion. But we know of crystallization taking place in the most compact amorphous solids without any approach to fusion, as in the axles of railway-carriages; and of metamorphic action without semi-fusion, as in the highly indurated bottoms of bakers' ovens, in which the clay is subjected to a long-continued though not a great heat; or in the sandstone floor of an iron furnace, which, from long contact with the molten iron, loses its color, becomes white and hard, and breaks with a porcelanic fracture, having, indeed, been changed into quartz rock. Besides, the frequent occurrence of cavities in the rock crystals of granite, containing a fluid which fills them only when the temperature is raised to at least 94° F., shows that the crystal could not have been formed at a higher temperature. We are therefore safe in maintaining that the heat was not in all cases so great as to produce fusion.

2. *Pressure*.—This alone is sufficient to effect the consolidation and induration of aqueous deposits, converting clay or sand into solid stone. When heat is added to pressure, greater activity is likely to be the result. The undulatory movements of the earth's crust, by carrying down to great depths deposits formed on the surface, bring them under the influence of pressure, heat, and thermo-electricity, and at the same time elevate rocks that have been thus acted upon.

METAMORPHIST—METAMORPHOSIS.

It is thought that heated water may be also a powerful agent, especially when subjected to great pressure.

These and other agents, then, operating through immense intervals of time, set in motion chemical attraction, whereby the various substances which entered into the composition of the sedimentary deposits rearranged themselves as they are found in the M. R.

For description of the various M. R., see their different titles: viz., GNEISS: QUARTZITE: MICA-SCHIST: CLAY-SLATE: MARBLE.

METAMORPHIST, n. *mět-ă-mör'fist* [Gr. *meta*, beyond, over; *morphē*, form, shape]: in *chh. hist.*, certain sacramentarians of the 15th c., who affirmed that Christ's natural body with which he ascended was wholly deified, and had entirely lost its humanity.

METAMORPHOSIS, n. *mět'ă-mör'fō-sīs*, **MET'AMOR'PHOSES**, n. plu. *-fō-sēz* [L. *metamorphōsis*, a transformation—from Gr. *meta*, beyond, over; *morphē*, form, shape: F. *métamorphose*]: change of form or shape; a transformation (see **METAMORPHOSIS**): a change in the form of being, as insects (see **METAMORPHOSIS OF ANIMALS**). **MET'AMOR'PHIC**, a. *-fīk*, pertaining to the changes in the earth's strata since their first deposition, by some external or internal agency; applied to the power or force causing the change; a transforming. **MET'AMOR'PHISM**, n. *-fīzm*, the state or quality of being metamorphic; the process of transformation; in *geol.*, that change of structure, or of texture, which has been effected on many rocks by the agency of heat, chemical action, or otherwise. **METAMORPHOSE**, v. *mět'ă-mör'fōs*, to change into a different form; to transform. **MET'AMOR'PHOSING**, imp. *-fō-sing*. **MET'AMOR'PHOSED**, pp. *-fōsd*: **ADJ.** changed into a different form; transformed. **METAMORPHIC SYSTEM**, in *geol.*, those crystalline schists, as gneiss, quartz-rock, mica-schist, and clay-slate, which underlie all the fossiliferous strata, and in which no trace of organic remains has yet been detected: see **METAMORPHIC ROCKS**.

METAMOR'PHOSIS, in Ancient Mythology: transformations of human beings into beasts, stones, trees, and even into fire, water, etc. The origin and significance of such fables it is often impossible to determine. Some originated, probably, in observation of the wonderful transformations in nature; some in a misapprehension of the metaphors employed by the older poets; and some, perhaps, in mere superstition and love of the marvellous. The wild imagination of the Orientals filled their mythologies with metamorphoses; and the classic mythology approaches them in this respect. They were the theme of some of the poets and other Greek authors of the Alexandrine period, and of Ovid among the Latin classics. The mediæval literature of Europe, especially of Germany, in its fairy tales and other forms of folklore, also is wonderfully rich in metamorphoses.

METAMORPHOSIS OF ORGANS.

METAMORPHOSIS OF ANIMALS: change which certain animals undergo after their escape from the envelope of the egg, and which is of such a nature as essentially to alter the general form or the mode of life of the individual. The most remarkable metamorphoses occur in the Batrachians, Crustaceans, Insects, and Tape-worms (see those titles). The change in insects from ovum to larva is sometimes called *transformation*; while the change from larva to pupa and from pupa to imago is *metamorphosis*. A curious case of metamorphosis is that of Axolotl (q.v.) to Amblystoma.

METAMORPHOSIS OF ORGANS, in Botany: made by Goethe a separate branch of botanical science, and called Morphology—a term now used for the science of organic form (see DARWINIAN THEORY). It may almost be said that nothing was known either of the facts or laws of M. till the poet Goethe proclaimed them to the world in his treatise, *Die Metamorphose der Pflanzen*, 1790. Linnæus had, indeed, called attention to the development of organs and the changes which they undergo, and had made this the subject of a *thesis* entitled *Prolepsis Plantarum* in 1760; but, in a manner very unusual with him, he mixed with his observations and philosophical speculations certain fanciful suppositions, whose fallacy, soon becoming apparent, caused all the rest to be neglected. Wolff afterward extricated the true from the fanciful in the views of Linnæus, and gave them greater completeness; but he introduced the subject only incidentally in a paper on comparative anatomy, which failed to attract the attention of botanists, and probably had never been seen by Goethe, whose discovery, apparently altogether original, is one of the finest instances on record of acute observation combined with philosophical generalization.

For the metamorphosis of organs, see titles of the particular organs. Only a very general statement of its facts and laws is here made. A plant is composed of the *axis* and its *appendages*; the axis appearing above ground as the stem and branches, below ground as the root; the appendages being entirely above ground, and essentially *leaves*; all organs which are not formed of the axis being modified leaves. The proof of this consists very much in the gradual transition of one organ into another, manifest in some plants, although not in others; as of leaves into bracts, one of the most frequently gradual transitions; of leaves into sepals, as seen in the leaf-like sepals of many roses; of sepals into petals, as seen in the petal-like sepals of lilies, crocuses, etc.; of petals into stamens, as seen in water-lilies; and even of stamens into pistils, often exemplified in the common house-leek. The proof is confirmed and completed by observation of the monstrosities which occur in plants, particularly in the frequent return of some part of the flower to its original type, the leaf, and in the conversion of one part of the flower into another, which is often the result of cultivation, and is particularly

METAMORPHOSIS OF TISSUE—METAPHOR.

illustrated in *double* flowers, the increase of the number of petals being the result of the conversion of stamens into petals.

A flower-bud being a modified leaf-bud (see BUD), and a flower therefore the development of a modified leaf-bud, the parts of a flower correspond in their arrangement with the leaves on a branch. But peculiar laws govern the development of organs in each species of plant. Thus, the leaves in one are opposite; in another, alternate; in another, whorled; all depending on the law which governs the growth of the axis in relation to the development of leaves, which is very constant in each species; and in like manner the parts of the flower are developed in whorls around an abbreviated terminal portion of the axis, the energies of the plant being here directed to the reproduction of the species, and not to the increase or growth of the individual. The fruit itself, being formed from the pistil, is to be regarded as formed of modified leaves. Goethe truly says: 'The pod is a leaf which is folded up and grown together at its edges, and the capsule consists of several leaves grown together; and the compound fruit is composed of several leaves united round a common centre, their sides being opened so as to form a communication between them, and their edges adhering together.'

The metamorphosis of organs has been investigated with great diligence and success and beautifully elucidated by Miquel, Lindley, Schleiden, and other botanists.

METAMORPHOSIS OF TISSUE: see TISSUE.

METAPLECTIC ACID, *mět'ă-pěk'tik* [Gr. *meta*, change, and Eng. *pectic*]: an acid produced from pectin, and from pectic and pectosic acids, by prolonged boiling, prolonged contact with an acid or an alkali, or by decay.

METAPHERY, n. *mět'ăf'ēr-ī* [Gr. *meta*, beyond; *phorēō*, I bear]: in *bot.*, the displacement of organs.

METAPHOR, n. *mět'ă-för* [F. *métaphore*—from Gr. *metaphōră*, a change of one thing for another—from *meta*, over, change; *phorēō*, I bear, I carry]: figure of speech expressed in a single leading word; a similitude—for example, 'the man is a lion,' is a metaphor; 'the man is as bold as a lion,' is a simile. Metaphor is an ideal characterization or illustration which may be affirmed by one mind and denied by another, or affirmed and denied by the same mind at different times: it is a kind of comparison, in which the speaker or writer, casting aside the circumlocution of the ordinary similitude, seeks to attain his end at once, by boldly identifying his illustration with the thing illustrated. It is thus of necessity, when well conceived and expressed, graphic and striking in the highest degree, and has been a favorite figure with poets and orators and the makers of proverbs in all ages. Even in ordinary language the meanings of words are in great part metaphors; as when we speak of an *acute* intellect or a *bold* promontory: all such words are *in metaphor*, and the language may be

METAPHOSPHORIC—METAPHYSICS.

called *metaphorical*. METAPHORIST, n. *mět'ă-för'ist*, one who uses metaphors. METAPHORICAL, a. *-för'î-käl*, or METAPHORIC, a. *-för'ik*, not literal; containing metaphor; figurative. METAPHORICALLY, ad. *-käl-lî*.

METAPHOSPHORIC, a. *mět'ă-fös-för'ik* [Gr. *meta*, over, and Eng. *phosphoric*]: designating phosphoric acid combined with one molecule of water.

METAPHRASE, n. *mět'ă-frāz* [Gr. *meta*, over, change; *phrasis*, a phrase]: a verbal or literal translation of a language. METAPHRAST, n. *-fräst*, one who translates verbally. METAPHRAS'TIC, a. *-tîk*, literal; close interpretation.

METAPHYSICS, n. sing. *mět'ă-jîz'îks* [Gr. *metaphusika*, after those things which relate to external nature—that is, after physics—from *meta*, beyond, after; *phusikos*, relating to nature—from *phusis*, nature: F. *métaphysique*: It. *metafisica*]: the science of mind or intelligence, as distinguished from the science of natural bodies or matter; the philosophy of the facts of consciousness; philosophy in the general sense of the term, together with psychology. The term M. was applied first to a certain group of the philosophical dissertations of Aristotle (see ARISTOTLE). As since employed, it has had various significations, especially two—a larger and a more confined. In the more confined sense, it is allied to the problems of the Aristotelian treatise, and is concerned with the ultimate foundations of our knowledge of existing things. What is the nature of our knowledge of the external world, inasmuch as mind cannot properly know what is not in contact with itself? has been asked by philosophers, and answered in various ways; and this is the great question of M. (see PERCEPTION: COMMON SENSE). The name 'Ontology' has been applied to the same inquiries into our cognizance of existences out of ourselves. But as the solution of this difficult question was found to involve an investigation into the nature of the human mind, it became allied with the science whose object it is to describe fully and systematically the laws and properties of our mental constitution—a science called by the various names of Psychology, Mental Philosophy, Moral Philosophy; hence M. came to be an additional name for this more comprehensive department. The word is employed at the present day by writers of repute in both meanings. Thus, Ferrier's *Institutes of M.* is occupied solely with the questions connected with knowledge, or the nature of our perception of an external world; his explanatory title is, *The Theory of Knowing and Being*. On the other hand, Mansel's M. is divided into two parts—PSYCHOLOGY, or the science of the facts of consciousness, which expresses the science of mind generally; and ONTOLOGY, or the science of the same facts considered in their relation to realities existing without the mind—that is, the problem of perception, or M. in the narrower sense. METAPHYSICAL, a. *-jîz'î-käl*: existing only in thought and not in reality; abstract; pertaining to metaphysics.

METAPLASM—METASTASIO.

MET'APHYS'ICALLY, ad. -*kāl-lī*. **MET'APHYSI'CIAN**, n. -*fž-zīsh'ān*, one versed in the science of metaphysics. *Note.*—**METAPHYSICS**, supposed to be so called by the ancients, because they considered the science of natural bodies, or *physics*, the first in order of study, and the science of mind the second; but the name more probably arose from the simple fact that the writings of the first philosophy came after the physical treatises of the author—that is, *meta ta plusika*, after physics.

METAPLASM, n. *mět'ā-plāzm* [F. *métaplasme*—from Gr. *metaplas'mos*, a transformation—from *meta*, beyond, over; *plasso*, I form]: in *gram.* or *rhet.*, a general term used to embrace all those figures of speech which designate changes in the letters or syllables of a word; in *bot.*, the matter which gives the granular character to protoplasm in a living cell.

METAPODES, n. plu. *mět-āp'ō-dēz* [Gr. *meta*, after, change; *podēs*, feet]: the hind legs.

METAPODIUM, n. *mět'ā-pō'dī-ūm* [Gr. *meta*, beyond, after; *podēs*, feet]: the posterior lobe of the foot in mollusca.

METAPOPHYSIS, n. *mět'ā-pōf'i-sīs* [Gr. *meta*, beyond; *apoph'usis*, a spout, a process]: the mammillary processes of the vertebræ, according to Owen.

METAPTOSIS, n. *mět-āp-tō'sīs* [prefix *meta-*; Gr. *ptosis*, a falling]: in *med.*, any change in the form or seat of a disease.

METASPERMS, n. plu. *mět'ā-spērmz* [Gr. *meta*, beyond; *sperma*, seed]: in *bot.*, another name for **ANGIOSPERMS**, which see.

METASTASIO, *mā-tās-tā'ze-ō* or *mět-a-stā'ze-o* (originally **TRAPASSI**), **PIETRO**: one of Italy's most admired poets: 1698, Jan. 6—1782, Apr. 12; b. Rome; of humble parentage. He gave early evidence of genius by his boyish improvisations. M. having attracted the casual notice of Gravina, famous jurisconsult, the latter undertook the entire education and career of the youth, whose paternal name of Trapassi became thenceforward Grecized into Metastasio, both words being identical in signification. The young poet speedily advanced in classical and general knowledge; and to his patron's enthusiastic devotion to the Greek drama may doubtless be traced much of the after-bent of M.'s own poetical tastes. By the early death of Gravina, M. was placed in possession of considerable property. In 1724 he published one of his most celebrated dramas, *La Didone*, which, with *Il Catone* and *Il Siroe*, conferred on the poet a European name. In 1730 M. accepted the post of poet-laureate to the imperial court of Vienna. During his sojourn in Vienna, M. composed *Giuseppe Riconosciuto*, *Il Demofonte*, and the *Olimpiade*. He died at Vienna. M. was amiable and attractive in person and manner: he was of somewhat timid disposition. Two persons, after Gravina's death, became so impressed with his talents and

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attracted by his personal charm, that they practically made him a pensioner on their bounty—one, the great Roman prima-donna Marianna Bulgarelli (called La Romanina); the other, Countess Althann, in Vienna. His works are very numerous, embracing 63 dramas, 48 cantatas, besides numberless elegies, canzonette, sonnets, and translations. They have unexampled popularity among all grades of his countrymen; in their pure classical subjects and forms, the educated student finds instruction and delight; while their facile musical grace and verbal simplicity adapt them to the popular appreciation of the artless beauties of poetry. The best editions of M. are those of Turin (1757, 14 vols.); Paris (1755, 12 vols.); Paris (1780, 12 vols., large 8vo); Genoa (1802, 6 thick vols.); Mantua (1816–20, 20 vols.).

METASTASIS, n. *mě-tăs'tă-sīs* [Gr. *metastăsis*, a change of form or place—from *meta*, over; *stasis*, a placing or setting, a posture]: removal of a disease from one part of the body to another—e.g., rheumatism, gout, mumps, etc., some of which fly from joint to joint, others from the tissues of one organ to the analogous tissue in another kind of organ. M. is applied also to the removal of food-products, as starch, sugar, etc., from one part of a plant to another.

METASTOMA, n. *mě-tăs'tō-mă*, or **METASTOME**, n. *mět'ă-stōm* [Gr. *meta*, after; *stoma*, the mouth]: the plate which closes the mouth posteriorly in crustaceans.

METATARSUS, n. *mět'ă-tăr'sūs* [Gr. *meta*, beyond, over; *tarsos*, the sole of the foot]: the part of the foot between the ankle and the toes. **METATARSAL**, a. *mět'ă-tăr'săl*, pertaining to the metatarsus or instep: N. the metatarsal bone.

METATHESIS, n. *mě-tăth'ě-sīs* [Gr. *metathēsīs*, change—from *meta*, beyond, over; *tithēmī*, I put or place; *thesis*, a placing]: a term designating the transposing of the letters or syllables of a word; in *surg.*, an operation by which a morbid agent is removed from one place to another, where it may produce less disturbance, e.g., in couching for cataract.

METATHORAX, n. *mět'ă-thō'răks* [Gr. *meta*, beyond, over, and *thorax*, the chest]: in *insects*, the third and last segment of the thorax—the second being called *mesothorax*.

MÉTAYER, n. *mă-tă'yěr* [F. *métayer*, a farmer—from mid. L. *mediētāriūs*—from *mediūs*, middle]: cultivator of a farm, under stipulation to give the landlord a portion of the produce as his rent. In some older French dictionaries, e.g., that of Trevoux, the word is said to apply to any kind of farmer; but in the oldest dictionary of French and English, Cotgrave's, the word is thus interpreted: 'Properly one that takes ground, to the halves, or binds himself by contract to answer unto him of whom he holds them half, or a great part of the profits thereof.' The term has lately got a meaning in political economy

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on account of some eminent writers having raised the question, whether this arrangement between landlord and tenant is not so much more advantageous than any other, both to the parties immediately concerned, and to the public at large, that it ought to be specially encouraged. Sismondi appears to have been the first to open this wide view of the influence of the practice, and he has given a chapter to its consideration in his *Political Economy* (b. iii. chap. 5). He says what cannot be denied, that such an arrangement was a great improvement on mere serfdom, which gave the cultivator no interest in the produce of his industry. But in giving the reasons for his admiration of the system as one which provides in the general case for the wants of the peasant while relieving him of all anxiety about markets and prices, he admits that a M. peasantry never advance beyond the humble, happy, and contented lot which immediately falls to them. It is a system, therefore, inconsistent with the application of large capital to cultivation, and consequently with the extraction of the highest value which the soil can yield. A tenant will hesitate to lay \$100 worth of guano on his fields if half the additional crop that it will bring goes to his landlord. To those who maintain that the moral effect of the system is beneficial, this will be no argument against it; but to the political economist it is an argument against its practicability in a rich money-making agricultural country. Where there is an enterprising peasantry without capital it is a valuable resource; a great portion of the valuable agricultural districts of Scotland were thus brought into cultivation by improvers whose rent was a portion of the crop. But while these very districts in a great measure owe their present prosperity, and the existence of a set of capitalist-farmers to such a system of cultivation pursued with more energy than M. Sismondi considers natural to it, there is no doubt that the substitution at the present day of such an arrangement for money-rent would be a very serious waste.

METE, v. *mēt* [Goth. *mitan*; Dut. *meten*; to measure: OF. *metre*, *metre*—from L. *metrum*; Gr. *metron*, a measure: L. *metīrī*, to measure]: to measure; to ascertain the dimensions or capacity of by a rule or standard. ME'TING, imp. ME'TED, pp. METER, n. *mē'tér*, an instrument that measures, as *gas-meter*. GAS METER (see GAS, LIGHTING BY). METE-STICK, on *shipboard*, a measure used to preserve proper levels in storing the cargo.

METELLUS, *mē-tēl'ūs*: name of a Roman family, the most important of the plebeian gens Cæcilia, which rose to be one of the first families of the Roman nobility.—One of the most distinguished members of the family was QUINTUS CÆCILIUS M. MACEDONICUS, who received his surname from his victory over Andriscus, an aspirant to the throne of Macedonia (B.C. 148). His life was considered by ancient writers an example of the greatest felicity: before his death three sons had

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been consuls, one censor. He d. B.C. 115.—Another was QUINTUS CÆCILIUS M. NUMIDICUS, who twice defeated Jugurtha in Numidia (B.C. 109), and was noted for integrity, but was superseded in his command by Marius.—His son, QUINTUS CÆCILIUS M., surnamed *Pius*, joined Sulla, B.C. 83, but sought to moderate the severity of his proscriptions. He, too, bore a distinguished character for virtue.—QUINTUS CÆCILIUS M. CRETICUS conquered Crete and reduced it to a Roman province (B.C. 67).—QUINTUS CÆCILIUS M. PIUS SCIPIO, sometimes called QUINTUS SCIPIO, and sometimes SCIPIO M., was son of Publius Cornelius Scipio, who was adopted by one of the Metelli, and became the father-in-law of Pompey, and his zealous partisan. He commanded under him at Pharsalus, maintained war on his behalf for some time in Africa; and after his defeat at Thapsus (B.C. 46), died by his own hand. He was selfish and licentious.

METEMPSYCHOSIS, n. *mě-těm'sī-kō'sīs* [Gr. *metempsychōsis*, the passage of the soul from one body to another—from *meta*, beyond, over; *psychē*, life]: the passing of the soul of a man after death into the body of another man or into a lower animal, or through a succession of them; transmigration: see TRANSMIGRATION OF SOULS.

METEMPTOSIS, n. *mět'ěm-to'sīs* [Gr. *meta*, after; *emptōsis*, a falling upon]: the solar equation necessary to prevent the new moon happening a day too late; the omission of leap-year every 134 years: *proemptosis* is the addition of a day every 330 years, and another every 2,400 years.

METENSOMATOSIS, n. *mět'ěn-sō'mă-tō'sīs* [Gr. *meta*, change; *en*, in; *soma* or *somata*, a body]: the change or transmutation of the elements which have formed one body into the substance of other bodies, similar or dissimilar.

METEOR, n. *mět'tě-ēr* [F. *météore*—from Gr. *metēōrōs*, raised high above the earth, sublime: It. *meteora*]: any natural phenomenon or appearance of a transitory nature taking place in the atmosphere; a luminous body or appearance in the sky; a falling star (see METEORS). **METEORIC**, a. *-ōr'īk*, pertaining to meteors; of or belonging to the atmosphere; produced in or falling from the atmosphere; applied figuratively to any person or thing on account of brilliancy or irregularity, or both. **METEORIFEROUS**, a. *-īf'ēr-ūs* [L. *fero*, I bear]: bearing or producing meteors. **METEORITE**, n. *mět'tě-ōr-īt*, a stone or body falling from the higher regions of the atmosphere, or from regions without it; also **METEOROLITE**, n. *-ōr'ō-līt* [Gr. *lithos*, a stone] (see AEROLITE: METEORS). **METEOROSCOPE**, n. *-ō-skōp*, instrument for taking angles, and making measurements of the heavenly bodies. **METEOROUS**, a. *mē-tě'ō-rūs*, having the nature of a meteor. **METEORIC IRON**, the iron found in meteoric stones, principally an alloy of iron and nickel. **METEORIC STONES**, those masses of hard matter which

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frequently fall on the earth from the upper regions; aerolites.

METEOROLOGICAL, a. *mě'tě-ör-ō-lěj'ĩ-kāl* [Gr. *metē-ōros*, raised high above the earth; *logos*, a discourse]: relating to the atmosphere and its phenomena; pertaining to a register or table of the state of the air and its temperature, etc.; also **ME'TEOROLOG'IC**, a. *-lěj'ík*. **ME'TEOROL'OGY**, n. *-öl'ō-jĩ*, the science which explains the various phenomena which have their origin in the atmosphere, such as rain and wind, snow and hail, cloud and sunshine, temperature and barometric pressure, etc. **ME'TEOROL'OGIST**, *-jĩst*, one versed in the various phenomena appearing in the atmosphere. **METEOROGRAPH**, n. *mě'tě-ér-ō-grāf*, apparatus for registering meteorological phenomena. It was invented by a Jesuit, Father Secchi of Rome, who obtained a prize for it at the Paris International Exhibition 1867. **METEOROGRAPH'IC**, a. *-ō-grāf'ík*, pertaining or relating to meteorography. **ME'TEOROG'RAPHY**, n. *-ōg'ra-fĩ*, meteorology; the registration of meteorological phenomena. **METEOROM'ETER**, n. *-ōm'ě-tér*, in *teleg.*, apparatus for receiving at a local station, transmitting to a central station, by telegraph-wires, and there recording, the direction and velocity of the wind, condition of the barometer and thermometer, and amount of rainfall.

METEOROL'OGY: term denoting originally the consideration of all appearances in the sky, both astronomical and atmospherical; but the term is now confined to that department of nat. philosophy which treats of the phenomena of the atmosphere as regards weather and climate. For the leading points of this wide subject, see such titles as **AEROLITE: ATMOSPHERE: BAROMETER: BOILING: CLOUDS: DEW: ELECTRICITY: EVAPORATION: FOG: HAIL: HALO: LIGHTNING: MAGNETISM: METEORS: DUST (METEORIC): RAIN: SNOW: STORMS: ETC.**—also **CYCLONE.**

Owing to the complexity of the phenomena, M. is the most difficult and involved of the sciences, and seems, indeed, at first sight, almost incapable of being reduced to a science at all. On this account, the only procedure admissible in the first place is long and patient observation, and a faithful recording of facts.

From the nature of the subjects with which the science deals, it may be inferred that they occupied men's minds, from remote antiquity. The splendid and ever-varying panorama of the sky, and the changes of temperature through the days and the seasons, with all the other elements constituting the weather, and thus powerfully affecting the necessities and comfort of man, are phenomena certain to arrest his attention. From the time spent in the open air in the early ages, and from the imperfect protection against the inclemency of the seasons, those appearances which experience proved to precede a change of weather would be eagerly recorded and handed down. In this way, many most valuable facts were ascertained and passed current from hand to hand; and probably there is no science of which more of the leading facts and inferences have been from so early a period incorporated into popular language.

Aristotle was the first who collected, in his work *On Meteors*, the current prognostics of the weather. Some of these were derived from the Egyptians, who had studied the science as a branch of astronomy, while a considerable number were the result of his own observation, and bear the mark of his singularly acute and reflective mind. The next writer who took up the subject was Theophrastus, one of Aristotle's pupils, who classified the opinions commonly received regarding the weather under four heads, viz., the prognostics of rain, of wind, of storm, and of fine weather. The subject was discussed purely in its popular and practical bearings, and no attempt was made to explain phenomena whose occurrence appeared so irregular and capricious. Cicero, Virgil, and a few other writers also wrote on the subject without making any substantial additions; indeed, the treatise of Theophrastus contains nearly all that was known until comparatively recent times. Partial explanations were attempted by Aristotle and Lucretius, but as they lacked the elements necessary for such an inquiry, being almost totally ignorant of every

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department of physical science, their explanations were necessarily vague, and often ridiculous and absurd.

In this dormant condition, M. remained for ages, and no progress was made till proper instruments were invented for making real observations with regard to the temperature, the pressure, the humidity, and the electricity of the air. The discovery of the weight or pressure of the atmosphere made by Torricelli 1643, was undoubtedly the first step in the progress of M. to the rank of science. This memorable discovery disclosed what was passing in the more elevated regions of the atmosphere, and thus the elevations and depressions of the barometric column largely extended the knowledge of this subtle element. See BAROMETER.

The invention and gradual perfecting of the Thermometer (q.v.) in the same century, formed another capital step; as without it, nothing could be known beyond vague impressions, regarding temperature, the most important of all the elements of climate. This great invention soon bore excellent fruit. Fahrenheit constructed small and portable thermometers, which, being carried by medical men and travellers over every part of the world, furnished most valuable observations—the comparative temperature of different countries became known, and the exaggerated accounts of travellers with regard to extreme heat and cold were reduced to their proper meaning. Scarcely less important was the introduction of the Hygrometer (q.v.), first systematically used by De Saussure (died 1799), afterward improved by Dalton, Daniell, and August. From the period of the invention of these instruments, the number of meteorological observers greatly increased, and a large body of well-authenticated facts of utmost value was collected. The climates of particular parts of the earth were determined, and the science made great and rapid advances by the investigations undertaken by distinguished philosophers into the laws which regulate the changes of the atmospheric phenomena.

The theory of the trade-winds was propounded first by George Hadley in *Philosophical Transactions* 1735. It is a remarkable fact, that, for about half a century, it remained quite unnoticed, when it was independently arrived at by Dalton, and published in his essays.

The publication of Dalton's *Meteorological Essays*, 1793, marks an epoch in M. It is the first instance of the principles of philosophy being brought to bear on the explanation of the intricate phenomena of the atmosphere. The idea that vapor is an independent elastic fluid, and that all elastic fluids, whether alone or mixed, exist independently; the great principles of motion of the atmosphere; the theory of winds, their effect on the barometer, and their relation to temperature and rain; observation on the height of clouds, on thunder, and on meteors; and the relations of magnetism and the aurora borealis—are some of the important questions discussed

in these remarkable essays, with an acuteness, a fullness, and a breadth of view that leave little to be desired.

One of the most interesting and fruitful subjects that engaged the inquiries of meteorologists was *dew*. The observations on this subject were first collected and reduced to a perfect theory by Dr. Wells: see *DEW*.

In 1823, Daniell published his *Meteorological Essays and Observations*, which, while adding largely to our knowledge in almost every department of the subject, are valuable chiefly as bearing on the hygrometry of the atmosphere. Though the practical advantages which he anticipated would flow from it have not been realized, yet this difficult and still obscure department of M. stands indebted to him more than to any other philosopher. The law of the diffusion of vapor through the air, its influence on the barometric pressure, and its relations to the other constituents of the atmosphere, are among the least satisfactorily determined questions in M. Since this element is so important as an indicator of storms and other changes of the weather, and since so much remains to be achieved, it is to be hoped that it will soon be more thoroughly investigated. A most important addition has lately been made to our knowledge of the vapor of the atmosphere by Prof. Tyndall, in his experiments on radiant heat, especially as regards the gases. The vapor of water is there shown to exert extraordinary energy as a radiant and absorbent of heat; hence the vapor dissolved in the air acts the part of a covering or protection to the earth. As it is, to some extent, impervious to solar and terrestrial radiation, it follows that if the air were quite drained of its moisture, the extremes of heat and cold would be so intense and insufferable, that all life would instantly perish, there being no screen shielding the earth from the scorching glare of the sun by day, and from the equally scorching and blighting effects of its own radiation by night. It is to be expected that this great discovery will soon throw light on many questions of meteorology.

Electrical observations have been, of all meteorological observations, perhaps the least productive, due partly to their scantiness, from the expense and trouble attending them; and partly, no doubt, to the free and bad use made of the name of electricity by crude theorists in explaining phenomena of which it would have been wiser to confess their ignorance. But the brilliant discoveries recently made on the mutual relations of heat, motion, electricity, magnetism, and the other forces of matter, lead us to indulge the hope that the application of these results to M. will be attended with discoveries equally brilliant and important.

Humboldt's treatise on *Isothermal Lines* (1817) constitutes a notable epoch in experimental M. Dové has since continued the investigation, and in his splendid work, *On the Distribution of Heat on the Surface of the Globe*, has given charts of the world, showing the temperature for each month and for the year, and also

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charts of abnormal temperatures. It is scarcely possible to overestimate the value of this work, for though, to a considerable extent, the lines are hypothetical, there can be no doubt that a close approximation to the march of mean temperature and its distribution over the earth through the year, has been made. The idea has been carried out with greater fulness of detail by the U. S. govt. in the beautiful and elaborate series of charts of temperature and rainfall in the *Army Meteorological Register* 1855. In these charts, the temperature and rainfall in the different seasons for every part of the United States, deduced from accurate observations, may be seen at a glance. Buchan has published isothermals for the British Isles, Mohn for Norway, and Blandford for Hindustan; and isothermals for the sea have been published by the British admiralty.

The establishment of meteorological societies during the last 20 years must also be commemorated as contributing in a high degree to the solid advancement of the science which, more than any other, must depend on extensive and careful observation. In this respect, the United States stand pre-eminent, the observers there numbering nearly 800. Great Britain is well represented in the English and Scottish societies, which together number above 200 observers. In France, Germany, Russia, etc., the science is widely cultivated. Owing to the disastrous flooding of the Rhone, an inquiry has been carried on for several years, having for its object the determination of those causes which affect the rainfall in the basins of the Rhone and Saône. Observers in Germany and Great Britain have been secured to co-operate with the French observers, and under the management of a commission, it may be expected that important conclusions respecting the rainfall and the progress of storms will be arrived at, and means devised to avert the calamity of these great floods, by timely warning.

A special object of meteorological societies is to ascertain the degrees of heat, cold, and moisture in various localities, and the usual periods of their occurrence, together with their effects on the health of the people, and on the different agricultural productions; and by searching into the laws by which the growth of such products is regulated, the agriculturist may be enabled to judge with some degree of certainty whether any given article can be profitably cultivated.

But perhaps none of the arts have benefited to so large an extent by the labors of meteorologists as navigation. The knowledge thus acquired of the prevailing winds over different parts of the earth during different seasons of the year—and the regions of storms and calms—and the laws of storms, have saved innumerable lives, and by pointing out the most expeditious routes to be followed, have shortened voyages to a remarkable degree. In connection with this, the name of Capt. Maury (q.v.) deserves special commendation for his notable service to navigation.

Another fruit of the multiplication of meteorological stations is the prediction of storms and 'forecasts' of the weather, which have been carried on in the United States, and commenced with ability and success by Admiral Fitzroy in England. These 'forecasts' for Great Britain are based on telegrams received every morning from more than 40 selected stations in the British Islands, and on the continent from Haparanda as far s. as Lisbon. These telegrams give the exact state of the barometer, thermometer, hygrometer, and rain-gauge, with the direction and force of the wind, and appearance of the sky, at each of these 40 stations at eight in the morning. In the event of there being any storm or other atmospheric disturbance at one or more of these places, a full and accurate description of it is thus conveyed to London; and it is thence the duty of the officials there to consider the direction in which the storm is moving, so as to enable them to give warning of its approach by special signals. But in addition to warnings of storms, Fitzroy also issued daily 'forecasts' of the weather likely to occur in the different districts of Great Britain for the following two days, and which were in like manner founded on the state of the atmosphere at distant points, keeping in view the atmospheric currents known generally to prevail at that particular time of the year. As the cost of this system was about £2,000 annually, a severe test was applied, at the instance of the treasury, from 1861, July, to 1862, June, for the purpose of ascertaining whether the expenditure was justified by the success attending it. During the first six months, 413 signals were hoisted, and in 214 cases a storm occurred where a warning was given. It must not be inferred that in the remaining 199 cases there was no storm anywhere; all that was meant was, that no storm occurred at the places where the signal was given; but a storm may have occurred, and probably did occur, in some other part of the country. Now that the system has been longer in use, the signals are given from better knowledge of the movements of the atmosphere, so that if the test were again applied, the number of failures would be found much fewer. Since the barometric depression is in almost all cases spread over a wider area than the storm which accompanies it, and since the storm occasionally passes into the upper regions of the atmosphere, so as to be less felt on the earth's surface at that place, it is obvious that a considerable time must yet elapse before a sufficiently intimate knowledge of the movements of the air will be acquired for indicating with certainty the particular places where the storm will break out, and where it will not. The problem to be practically worked out is this: Given the telegrams from the stations showing the exact meteorological conditions prevailing over the included area, with indications of a storm approaching in a certain direction—to determine, not the probable area over which the tempest will sweep, but the precise localities which will altogether escape,

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the places where the storm will rage, and the places where it will not touch the earth, but pass innocuously into the upper regions of the atmosphere; its continuance, its violence, and the particular directions from which the wind will blow at the places visited by the storm while it lasts. Considerable progress has been made toward the solution of this difficult problem; and if a complete solution be impossible, such an approximation to a solution will doubtless be made as will render it foolhardy to disregard the warnings given.

But these predictions extend to only a few days. Does the present state of the science afford any grounds to hope that prediction for longer periods will be attained? Weather-registers extending over long periods give no countenance whatever to the notion that there are regularly recurring cycles of weather on which prediction may be based. Further, the manner in which good and bad seasons occur in different places with respect to each other, shows clearly that they have little direct immediate dependence on any of the heavenly bodies, but that they depend directly on terrestrial causes. Thus, while the summer of 1861 was almost unprecedentedly wet and cold in Scotland, the same summer was hot and dry to a degree equally unprecedented on the continent of Europe, particularly in Italy; and such examples may be multiplied almost *ad infinitum*.

The assumption that the equatorial and polar currents of wind at any locality may ultimately balance each other, gives ground for prediction extending over considerable intervals. Thus, a wet summer has been predicted for Britain from unusual prevalence of east winds in the spring—a prediction justified by the event. As s.w. winds prevailed till the next spring, less s.w. wind was looked for during the summer, which was thus expected to be fine and warm—a prediction which was realized. This prediction holds in about three cases out of four.

In recent years the chief advance in the science of M. has been in the practical application of the laws of storms in forecasting perturbations in the interest of agriculture and navigation. In this, great progress has been made. Although regular meteorological observations were made in the United States, at military posts, as early as 1818, which are still continued, the first attempt to inaugurate a national weather service was the organization, 1870, of the 'Division of Telegrams and Reports for the Benefit of Commerce and Agriculture,' a bureau for the thorough investigation of American storms and their pre-announcement along the great lakes and the sea-coast. It was under the auspices of the war department, and was immediately intrusted to Gen. Albert J. Myer (q.v.), chief signal officer of the army. He at once instituted the system of simultaneous observations and reports, without which no exact research or predictions had been possible. All previous observations had been reported according to local time; since then the observations at

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all the different stations in the United States are registered and reported at the same moments of actual time. Thus a daily or tri-daily view of the atmospheric conditions and changes over the whole country, as they actually are, is obtained. From these, then, are made the 'weather-maps,' which are maps of the United States on which are entered all the signal-service stations, at their proper geographical location, with figures annexed to each denoting the readings of the barometer and thermometer there, the velocity of the wind, amount of rainfall during the previous 8 or 24 hours, etc., besides symbols indicating the direction of the wind, and form and amount of clouds at the time of observation. Since 1873 a monthly summary of observations is published called the 'Monthly Weather Review;' while later began the tri-daily issue of weather 'Indications' and 'Cautionary Signals,' based on 3 series of simultaneous weather-reports telegraphed to Washington from all parts of the United States and Canada. The observations are taken at all stations at 7 A. M., 3 P. M., and 11 P. M. In 1879 the number of stations sending tri-daily reports was 133 in the United States and 1 in the W. Indies, except during the hurricane season when 5 reported from the W. Indies. The total number from which such reports were received daily was 159; while the total of stations in the United States that reported was 229. Of the tri-daily 'Indications,' 1,095 are telegraphed every year to the principal cities, and thence further distributed, till nearly every newspaper in the country prints them; while of 'Cautionary Storm Signals' there were 2,573 displayed in 1879. In 1872 Gen. Myer proposed to the United States congress, and 1873 to the International Meteorological Congress at Vienna, a system of daily simultaneous observations and reports from as many stations as possible throughout the world. The proposition was so favorably received that, 1875, July 1, the Signal Office at Washington began the daily publication of the 'International Bulletin,' giving the tabulated results of simultaneous observations in the United States, W. Indies, Mexico, Central America, S. America British N. America, Greenland, Great Britain, Ireland, Belgium, Denmark, the Netherlands, Germany, France, Spain, Norway, Sweden, Portugal, Russia, Algiers, Tunis, Turkey, Greece, Italy, China, Japan, Austria, Australasia, India, Morocco, S. Africa, the Azores, Malta, Mauritius, Sandwich Islands, Switzerland, and from vessels on the great ocean highways. The Signal Service in the United States has built, uses, and controls about 4,000 m. of telegraph, and employs the whole time of about 20 officers and 500 men, and a portion of the time of 150 others, besides having the co-operation of several times as many more volunteer or Smithsonian observers. The regular officers and men of the Signal Service are instructed at Ft. Whipple, Va., and at the central office at Washington, D. C., in all the branches of signaling, telegraphy, use of the various meteorological instruments, modes of ob-

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serving, etc. Each station is equipped with a barometer, thermometer, maximum thermometer, minimum thermometer, anemometer with electrical attachments and self-registering apparatus, hygrometer, wind-vane, rain-gauge; and, at stations on rivers, lakes, or on the sea-coast, with thermometers for taking the temperature of water at different depths. While much has been done in developing the science of M. and practically applying it, much more remains to be done, and continued research is needed in order fully to understand the laws governing the variations of temperature, the formation of clouds, atmospheric currents, the rise, velocity, direction, etc., of storms, winds, electrical storms, and the laws of rainfall, etc. In all these only a beginning has been made; yet facts like the following have been discovered, and are of practical importance. The average time of the first killing frost in various parts of the United States has been approximately ascertained. The 'red sunsets' prevailing from 1883, Aug., to 1886, June, were determined to have been due to the vapors mingled with combustion-products thrown up into the atmosphere by the volcanic eruption of Krakatoa, 1883, Aug. 27. The phenomena accompanying the unusually severe snow-storm in the eastern states known as the 'Blizzard,' 1888, Mar. 11-13, were carefully noted, studied, and at least partially explained. Important data have been gathered bearing on the question of the influence of forests on rainfall, while it has been established that forests tend to equalize the temperature, warding off extremes of cold and heat. These are only a few of the simplest important facts gathered in recent years.

The study of M. has of late been largely advanced by the establishment of high-level meteorological stations.

Thus the United States have two, one on Pike's Peak, 14,150 ft. high; France, Italy, and Switzerland have each several (one French station being 12,200 ft. high); and 1883 a British station was equipped on Ben Nevis. The nine arctic expeditions 1882-3 gave large attention to meteorological observations.

Kaemtz's *Meteorology* (transl. 1845); Drew's *Meteorology* (2d ed. 1860); Herschel's *Meteorology* (1861); Thomson's *Introduction to Meteorology* (1849); Buchan's *Handy Book of Meteorology* (1868) Loomis's *Treatise on Meteorology* (1868); R. H. Scott's *Elementary Meteorology* (1883).

METEOROMANCY, n. *mě'tē-ōr'ō-mān-sī* [Gr. *metēōros*, raised high above the earth; *mantei'a*, divination]: divination by thunder and lightning, much employed by the Romans.

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ME'TEORS: luminous bodies or appearances in the sky, or bodies entering the earth's atmosphere from regions of space: see **AEROLITE**. Of late, it is usual for astronomers and physicists to separate that class of M. known as 'shooting-stars' from the group of *meteorolites* or *meteorites*, on the ground that the most prominent appearances of the shooting stars are *periodic*, while the meteorites seem to occur at irregular intervals, and that the former have hitherto not been *proved* to leave any traces of their visit on the earth's surface. The *British Museum Guide* to the collection of fallen meteoric masses or meteorites, published 1881, divides them into three classes: (1) *Aërosiderites* or *siderites*, as consisting mainly of meteoric iron; (2) *aërosiderolites* or *siderolites*, conglomerates of iron and stone; (3) *aërolites*, almost wholly of stone (i.e., various minerals in crystalline condition, usually with a peculiar 'chondritic' or granular structure). It has lately been confidently asserted by one or two observers, that some chondritic meteorites show traces of organic remains—namely, of porous coral. Recent investigations have proved that new-fallen meteorites occlude six times their own bulk of gases, in the proportion of 46 per cent. hydrogen, 32 of carbonic oxide, and 18 of nitrogen. Some M. appear to be dissolved by heat in our atmosphere, and fall to earth in the form of meteoric dust. An attempt was made by Nordenskiöld 1880 to measure the quantity of meteoric dust that fell during a given time upon definite areas of snow along the Arctic Ocean. The amount that fell seems to be much more considerable than was previously imagined.

The star-shower on the night of 1866, Nov. 13, was the grandest ever observed in Britain. It was confidently predicted, from the occurrence of a similar shower at the corresponding date in 1799, 1833, and 1834. The shower commenced about 11:30 P.M., with the appearance at brief intervals of M. singly; then they came in twos and threes, steadily and rapidly increasing in number till 1h. 13m. A.M., Nov. 14, when no fewer than 57 appeared in one minute. From this time, the intensity of the shower diminished gradually, wholly ceasing about 4 A.M. The total number of M. which at that time came within the limits of the earth's atmosphere was estimated at about 240,000, and the number seen at each of the several observatories in Britain averaged nearly 6,000. This star-shower, like those of 1833 and 4, seemed to proceed from the region of the heavens marked by the stars ζ and γ in the constellation Leo; and it has been shown by astronomers that this was the point toward which the earth in her orbit was moving at the time; consequently, she had either overtaken the meteoric shower, or had 'met' it proceeding in a contrary direction. The M. on that occasion presented the usual variety of color, size, and duration; the great majority were white, with bluish or yellowish tinge; a considerable number were red and orange; a few were blue; many surpassed the fixed stars

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in lustre, and some were even brighter than Venus (the most brilliant planet as seen from the earth) at her maximum. Most of the M. left trains of vivid green light 5° – 15° in length, which marked their course through the heavens, and endured for $3''$ on an average, then becoming dissipated; though some of the trains were almost 40° in length, and remained in sight for several minutes.

In Nov. of next and later years, other great star-showers have been observed. It is now generally agreed that the November M. move in an orbit round the sun, inclined at about 7° to that of the earth, and that, in all probability, this orbit forms a ring or belt of innumerable small fragments of matter, distributed with very variable density of grouping along it, thus corresponding so far to the Planetoid (q.v.) group between Mars and Jupiter. It is agreed also that the motion of this meteor ring round the sun is retrograde; that the earth's orbit at that point where she is situated on Nov. 13–14, intersects this ring; and that, probably, in 1799, 1833–4, and 1866–7, it is the same group of M. which has been observed; and the last-mentioned hypothesis has been made the foundation of a calculation of the probable orbit and periodic time of this meteor-ring. The fact that a November star-shower generally occurs two years in succession, and then recurs at an interval of 32 or 33 years, seems to indicate that though the earth may pass through the meteor-orbit every year, the meteors are so grouped at intervals along the ring, and their periodic time differs so much from that of the earth, that it requires 32–33 years before this accumulating difference amounts to a complete revolution of either the earth or the ring, and a repetition of the star-shower becomes possible.

Professor Newton of Yale Univ., who entered into an elaborate investigation of the subject, concluded that the 5 possible periodic times (the earth's being taken as unity) of the meteor-ring were $2\frac{1}{33.25}$, $1\frac{1}{33.25}$, and $\frac{1}{33.25}$, and that of these, the fourth, $1 - \frac{1}{33.25}$, or 354.62 days, is the actual period of its revolution round the sun, and that, consequently, it has described 34 revolutions while the earth has described 33, the cycle of 34 meteor revolutions differing from 33 years by only 3.17 days; and in accordance with this estimate, he calculated its orbit and the approximate extent (seeing the meteor shower generally occurs in two successive years) of the meteor-group which produces the November showers. His conclusions have, however, been vigorously opposed by other eminent astronomers, such as Prof. Adams (q.v.) and Alexander Herschel, both of whom hold that the first four of the possible periods given by Prof. Newton are *impossible*, and that the last $\frac{1}{33.25}$ (i.e., that the meteor-ring makes $\frac{1}{33.25}$ of a solar revolution in a year, and one complete revolution round the sun in 33.25 years), is the correct estimate. If this view be correct, the meteor-group must be so much extended along its ring or orbit as to take more than a year to cross the earth's orbit, and a

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long time must necessarily elapse before a fair estimate of this extent can be obtained. A periodic time of $33\frac{1}{4}$ years, and an orbit which at the same time approaches so near the sun as to intersect that of the earth, indicate a path of great ellipticity, akin to those of the comets; and the idea of the cometary nature of these M. derives support from two remarkable facts, the one discovered by Schiaparelli of Milan, that this assumed orbit coincides very nearly with that of the great comet of 1862 (Prof. Adams connects this comet with the August M.), and the other by C. F. W. Peters of Altona, that it coincides with that of Tempel's comet.

Alexander Herschel also maintains that the M. are of recent origin, probably fragments from some of the great luminous bodies, and that though at present assembled in a comparatively dense group, the difference of their relative velocities will have the effect of gradually distributing them all over the meteoric ring, when a November shower will occur every year. Mr. Herschel also carefully observed 20 M. with the view of calculating their weight from the rate of their motion and the amount of heat (as shown by their brightness) evolved in the destruction of their velocity, by the resistance of the atmosphere, and found their weight to vary from 30 grains to $7\frac{1}{2}$ lbs.

The cause of the luminosity of M. was long in dispute, the two chief suppositions being, that the resistance of the atmosphere to a body dashing through it at about 30 m. per second, generated so much heat as to produce ignition; while the other was the action of terrestrial magnetism. The point most strongly urged against the first supposition, by the supporters of the second, was, that the height at which meteors were occasionally seen rendered any action of the atmosphere impossible; but as this objection was founded on the purely hypothetical opinion that the atmosphere did not extend more than about 50 m. from the earth's surface, it was not very cogent. This problem was handled by Sir John Herschel in an able paper in the *Edinburgh Review* (1848, Jan.), in which he clearly showed that the very high latent heat of the air in the higher and rarer parts of the atmosphere, would be sufficient to cause an enormous development of heat in the event of the air being compressed before a body advancing into it with a 'planetary' velocity. This opinion is now held by almost all eminent men of science. The enormous heat to which the meteor is thus subject produces incandescence, after which, with more or less facility, according to the nature of the materials of which the meteor is composed, the outer portion becomes liquid, and, by the powerful resistance of the air to the meteor's rapid course, is thrown off in a long stream, forming the tail, which, after rapidly losing its velocity, is precipitated to the earth as a fine dust like volcanic ash; while the meteor thus rapidly and constantly diminishing as it flies along in its headlong course, either becomes wholly

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dissipated into 'tail,' falls to the earth, or makes its way out beyond the limits of the earth's atmosphere, and continues its course. This supposition of exclusive atmospheric agency also gives a plausible explanation of the phenomenon of M. 'bursting,' this being caused by the sudden heating and consequent expansion of the outer part, while the interior was still in the state of intense cold acquired in interplanetary space.

The latest theory on the subject is that of Mr. Lockyer, and is based upon experiments made by him with the spectroscope on specimens of meteoric stone and iron. He found that by varying the conditions of temperature he obtained spectra from meteorites which reproduced the most peculiar features of nearly every variety of spectrum presented by the celestial bodies. His conclusion is that 'all self-luminous bodies in the celestial spaces are composed of meteorites, or masses of meteoric vapor, produced by heat, brought about by condensation of meteor swarms, due to gravity.' Accordingly 'the existing distinction between stars, comets, and nebulae rests on no physical basis;' they all are meteoric in origin, and the difference between them depends on differences in temperature, and on the closeness to each other of the meteorites composing them. New or temporary stars are produced by the clash of meteoric streams; and most variable stars are simply uncondensed meteoric streams. If this new theory is ever verified it will overthrow the nebular hypothesis of Laplace, and all of our present system of astronomy that is based thereon. As yet it is an unverified hypothesis.

While astronomers and physicists in general have been thus trying to reduce the phenomena of M. to a system, their chemical brethren have not been idle. Public collections of meteoric bodies have been made at Vienna, the British Museum, Paris, Berlin; and private ones by Mr. Greg of Manchester, Baron Reichenbach in Austria, and Prof. Shepard and others in the United States; and opportunities have thus been afforded of determining the nature of their composition.

METER: a measure: see under METE. METER, for MÈTRE, which see.

METER.

METER, or METRE, n. *mē'tēr* [OF. *metre*, *metre*—from L. *metrum*; Gr. *metron*, a measure, a poetical measure: comp. Skr. *mâtram*, the instr. of measuring (see METE)]: in *poetry*, the quality of the measured sound which distinguishes poetry from prose, and whose harmony pleases the ear; the number of syllables in a verse, as of a psalm or hymn. METRICAL, a. *mē'trĭ-kāl*, pertaining to meter; having rhythm; consisting of verses. MET'RICALLY, ad. -lĭ.—*Meter* is that regulated succession of certain groups of syllables in which Poetry (q.v.) is usually written. A greater or less number of groups forms a *line* or *verse* (Lat. a turning), and in modern languages the verses usually rhyme with one another; though this is not at all essential to the notion of meter: see RHYME: BLANK VERSE. In the classic languages, meter depended on the way in which long and short syllables were made to succeed one another. English meter depends, not upon the distinction of long and short, but upon that of *accented* and *unaccented* syllables. Thus, in the lines,

The cur' | few tolls' | the knell' | of part' | ing day'—
War'riors and | chiefs', should the | shaft' or the | sword'—

the accents occur at regular intervals; and the groups of syllables thus formed constitute each a meter, or measure. The groups of long and short syllables composing the meters of classic verse were called *feet*, each foot having a distinctive name. The same names are sometimes applied to English measures, an accented syllable in English being held to be equivalent to a long syllable in Latin or Greek, and an unaccented syllable to a short.

Every meter in English contains one accented syllable, and either one or two unaccented syllables. As the accent may be on the first, second, or third syllable of the group, there thus arise five distinct measures, two dissyllabic and three trisyllabic, as seen in the words—1, *fol'ly* (corresponding to the classic Trochee); 2, *recall'* (Iambus); 3, *ter'ribly* (Dactyl); 4, *confu'sion* (Amphibrachys); 5, *absentee'* (Anapæst).

These measures are arranged in *lines* or *verses*, varying in length in different pieces and often in the same piece. The ending measure of a line is frequently incomplete, or has a supernumerary syllable; and sometimes one measure is substituted for another. All that is necessary is, that some one measure be so predominant as to give a character to the verse. Constant recurrence of the same measure produces monotony. The following lines exemplify the five measures:

1st Measure.

Rich' the | treas'ure.

Bet'ter | six'ty | years' of | Eu'rope | than' a | cy'cle | of Ca|thay'.

2d Measure.

Aloft' | in aw'ful state'.

The prop'ler stud'y of | mankind' | is man',

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3d Measure.

Bird' of the | wil'derness.

War'riors and | chiefs', should the | shaft' or the | sword'.

4th Measure.

The dew' of | the morn'ing.

O young' Loch'invar' has | come out' of | the west'.

5th Measure.

As they roar' | on the shore'.

The Assyr'ian came down' | like a wolf' | on the fold'.

It is instinctively felt that some of these measures are better suited for particular subjects than others. Thus, the first has a brisk, abrupt, energetic character, agreeing well with lively and gay subjects, and also with the intense feeling of such pieces as *Scots wha ha'e*. The second is by far the most usual meter in English poetry; it occurs, in fact, most frequently in the ordinary prose-movement of the language. It is smooth, graceful, and stately; readily adapting itself to easy narrative and the expression of the gentler feelings, or to the treatment of severe and sublime subjects. The trisyllabic meters, owing to the number of unaccented syllables in them, are rapid in their movement, and calculated to express rushing, bounding, impetuous feelings. They are all less regular than the dissyllabic meters. One of them is frequently substituted for another, as in the opening of Byron's *Bride of Abydos*:

Know' ye the | land' where the | cy'press and | myr'tle

Are em'blems | of deeds' that | are done' in | their clime';

Where the rage' | of the vul'ture, the love' | of the tur'tle—

where each of the three lines is in a different meter. In addition to this irregularity, one of the unaccented syllables is often wanting. For instance, in Mrs. Hemans's poem, *The Voice of Spring*:

I come', | I come'! | ye have called' | me long';

I come' | o'er the moun'tains with light' | and song'—

the first line has only one measure of three syllables, although the general character of the versification is trisyllabic.

In a kind of verse introduced by Coleridge, and used occasionally by Byron and others, the unaccented syllables are altogether left out of account, and the versification is made to depend upon having a regular number of accents in the line:

There is' not wind' enough' to twirl'

The one' red leaf', the last' of its clan',

That dan'ces as oft'en as dance' it can'

On the top'most twig' that looks up' at the sky'.

Here there are four accents in each line, but the number of syllables varies from eight to eleven.

To scan a line or group of lines, is to divide it into the measures of which it is composed,

METER—METHANE.

The variety of combinations of meters and rhymes that may be formed is endless; but a few of the more usual forms of English versification have received special names, and these we may briefly notice.

Octosyllabics are verses made up each of four measures of the second kind of meter, and therefore containing eight (*octo*) syllables:

With fruit' less la'|bor, Cla'|ra bound'
And strove' | to stanch' | the gush'ing wound'.

Scott's poems are mostly in octosyllabics, also *Hudibras*, and many other pieces.

Heroic is a term applied to verses containing *five* meters of the second kind, or ten syllables. Heroics either rhyme in couplets, or are without rhymes, constituting blank verse. Many of the chief narrative and didactic poems in the English language are in rhyming heroics; as those of Chaucer, Dryden, Pope, Cowper, etc. Milton's two great poems, Young's *Night Thoughts*, Thomson's *Seasons*, Cowper's *Task*, Wordsworth's *Excursion*, and many others, are in blank heroics. Metrical dramas are almost always in blank verse; in which case there is frequently a supernumerary syllable, or even two, at the end of the line:

To be, | or not | to be, | that is | the ques|tion:
Whether | 'tis nobler in | the mind | to suf|fer.

In *Elegiacs*, the lines are of the same length and the same measure as in heroics; but the rhymes are alternate, and divide the poem into quatrains or stanzas of four lines, as in Gray's *Elegy*. The Spenserian stanza, popularized by Spenser in the *Fairy Queen*, and much used by Byron, differs from common heroics only in the arrangement of the rhymes, and in concluding with an Alexandrine (q.v.).

Service meter, also called *common meter*, is the form of versification adopted in the metrical Psalms, in many hymns, and other lyrical pieces. From being frequently employed in ballads, this meter is also called *ballad meter*. The first and third lines often rhyme, as well as the second and fourth.

Such are some of the more usual and definite forms of versification. In many poems, especially the more recent ones, so much license is assumed, that it is difficult to trace any regular recurrence or other law determining the changes of meter or the lengths of the lines; the poet seeks to suit the modulation at every turn to the varying sentiments. But it may be questioned whether much of this refinement of art is not thrown away, on ordinary readers at least, who, failing to perceive any special suitableness, are inclined to look upon those violent departures from accustomed regularity as caprice.

For the kind of verse called *Hexameter*, see that title.

METHANE, n. *mĕth'ān* [formed from *methyl*], or MARSH-GAS, or FIRE-DAMP: light carburetted hydrogen: see METHYL: CARBURETTED HYDROGEN.

METHEGLIN—METHODIST CHURCH.

METHEGLIN, n. *mě-thĕg'lin* [W. *meddyglyn*—from *medd*, mead; *lyn*, liquor, juice]: a beverage made of honey and water, fermented with yeast, and often spiced; mead.

METHINKS, v. *mē-thĭngks'* [*me*, and *think*]: it seems to me; it appears to me. **METHOUGHT**, pt. *mē-thawt'*, it did seem to me.

METHOD, n. *mĕth'ōd* [F. *méthode*—from Gr. *methōdōs*; L. *methōdus*, a proceeding in regular order, a mode— from Gr. *meta*, with, after; *hodos*, a way: It. *metodo*]: a suitable arrangement of things, proceedings, or ideas, to prevent confusion; a regular mode or manner of doing anything; orderly arrangement; system of arrangement peculiar to an individual; order; system; way; manner. **METHODIC**, a. *mĕ-thōd'ik*, or **METHOD'ICAL**, a. *-ĭ-kāl*, arranged or disposed with regularity; orderly; systematic; precise. **METHOD'ICALLY**, ad. *-kāl-lĭ*. **METHODIZE**, v. *mĕth'ō-dĭz*, to dispose in due order; to reduce to method. **METH'ODIZING**, imp. **METH'ODIZED**, pp. *-dĭzd*. **METH'ODIZA'TION**, n. *-dĭ-zā'shŭn*, reduction to method. **METHODIST**, n. *mĕth'ō-dĭst*, one of a sect of Christians founded by John Wesley—so called in 1729 from the regularity of their lives and the strictness of their rules; one who observes method. **METH'ODISM**, n. *-dĭzm*, doctrines and system of the Methodists. **METH'ODIS'TIC**, a. *-dĭs'tik*, or **METH'ODIS'TICAL**, a. *-dĭs'tĭ-kāl*, relating to method or the Methodists—in this last sense used contemptuously. **METH'ODIS'TICALLY**, ad. *-kāl-lĭ*. —**SYN.** of 'method': rule; regularity; course; mode; means; process; custom; fashion; habit; usage; plan; principle.

METH'ODIST CHURCH, FREE: organized 1860, at Pekin, N. Y., by persons who were or had been members of the Meth. Episc. Church, and who believed the latter church to have fallen away from its original simplicity and spirituality. They declared that members had been received without sufficient evidence of repentance and conversion; that worldly practices and unlawful business were tolerated; that many professed Methodists no longer possessed the direct witness of the Spirit; that they no longer had power over all sin, and not only seldom attained even professedly entire sanctification, but were at variance among themselves in their preaching on this subject; that there was great neglect of discipline; that simplicity of dress had given place to fashion and extravagance; that pews had taken the place of free seats, and choirs had supplanted congregational singing; that sermons were no longer preached, but read; church buildings were erected at extravagant cost; that church fairs were held; and that oath-bound fellowship with irreligious men in secret societies was tolerated and encouraged. While all the articles of faith of the Meth. Episc. Church are retained by the newer organization, two are added, emphasizing the doctrine of entire sanctification, and that of endless future rewards and punishment. The

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profession of the exercise of a saving faith, the laying aside of all superfluous ornaments of dress, abstinence from intoxicating drinks and tobacco, and the promise not to join any society requiring an oath, affirmation, or promise of secrecy, are made conditions of membership in the Free Meth. Church, as is also attendance at class-meetings. The government is confederal; quadrennial, annual, quarterly, and district conferences being held, composed of lay and ministerial delegates in equal numbers. In place of bishops, general superintendents are elected every four years. The official board is retained. District chairmen take the place of presiding elders. Class-leaders are nominated by the preacher in charge, and elected by their classes. Congregational singing is practiced, and religious services have much of the primitive warmth and zeal. While the field of this church is mainly among the poor and less educated classes, from whom chiefly its ministers are taken, it yet supports two prosperous educational institutions, one at North Chili, N. Y., the other at Spring Arbor, Mich. It publishes *The Earnest Christian*, a monthly magazine, and *The Free Methodist*, a weekly paper. In 1902 the church had 1,009 churches, ministers 1,001, and 28,038 communicants (a steady increase in the preceding 22 years).

METH'ODIST EPIS'COPAL CHURCH: oldest and largest body of Methodists in the United States. Though not formally organized until 1784, Dec., its origin must be traced to 1766, when some Irish Wesleyan immigrants formed themselves into a class, with Philip Embury, a local preacher, as leader, in New York. In 1768 classes were formed also on L. I., in N. J., Del., and Philadelphia, and the first chapel was dedicated in John street, New York. The first church was built in Philadelphia 1770. About the same time a society was formed in Md., and the first circuit was formed in Va. Francis Asbury arrived 1771; and, 1772, was appointed by Wesley supt. of the American societies. The first American conference was held 1773, with 10 preachers, representing 1,160 members of societies. Nearly all the preachers, being of English descent, sympathized with England during the revolutionary war, and returned to the mother country. Hardly any ordained men remained to administer baptism and the Lord's Supper, and a movement to provide for this independently of them threatened a rupture of the peace of the church. In 1780 Wesley applied to the bishop of London to ordain some one presbyter for the benefit of American Methodists; but was refused. In 1784 Wesley and two other presbyters ordained Thomas Coke, LL.D., as supt., and appointed Asbury as assistant, of the Methodist churches in America. Thereupon a general conference met in Baltimore, 1784, composed of 80 preachers, at which the 'Sunday Service,' the 'Twenty-five Articles' of faith, and an episcopal form of government, with an elective episcopate, were adopted. Thenceforward the growth of the church was rapid, while its organic structure was modified from time to time to meet exigencies,

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the plan of a delegated general conference being adopted 1808, and the first general conference held in 1812. Before the close of the 18th c., most of the characteristic features of the church had been clearly defined, Its territory had been divided into annual conferences; the foundations of its benevolent and educational enterprises had been laid; Sunday schools introduced; a publishing house established; and advanced ground taken on the subjects of temperance and slavery.

Doctrine.—The doctrine of the church is defined in the 25 articles, prepared, with the exception of the 23d, by John Wesley, from the 39 articles of the Church of England, with the intention that they should offer a broad basis upon which all evangelical Christians might unite. In 1834, the power to revoke or change these articles, or to establish new standards of doctrine, was taken from the authorities of the church. Its theology is broadly Arminian. Wesley's doctrine of 'assurance,' or 'the witness of the Spirit,' is firmly held, according to which the Holy Spirit 'works upon the soul by his immediate influence, and by a strong, though inexplicable, operation.' His doctrine of 'Christian perfection,' or 'sanctification,' also is very generally held. It is not meant to teach the attainment in this life of an absolute exemption from mistakes, infirmities, and temptations; but only that 'all saints may, by faith, be so filled with the love of God that all the powers of the soul shall be recovered from the abnormal, perverted, sinful condition, and, together with the outward conduct, be controlled in entire harmony with love.' The need of repentance and regeneration is emphasized; stress is laid on the doctrine of justification by faith alone; infant baptism is taught; and, for the rest, the orthodox faith professed by the leading evangelical denominations is held.

Government.—A series of 5 conferences administers the government of the church. The highest authority and sole legislative body is the 'General Conference,' which meets every 4 years. Prior to 1872, it, as well as the annual conferences, was composed of only ministerial delegates. In 1872 the lay element was admitted, and now the general conference consists of 1 minister for every 45 members of each annual conference, chosen by the ministers, and 2 laymen, chosen by lay electors from the quarterly conferences within the territory of the annual conference. Lay and ministerial delegates are united as one body, though provision is made for their separate vote whenever one-third of either element demands it. The body is presided over by the bishops. Besides being the court of final appeal, it elects bishops, missionary and educational secretaries, editors of its periodicals, and book agents. The 'Judicial Conference' consists of 'triers of appeals,' of whom each annual conference elects 7. It tries bishops, when the triers of 5 annual conferences must unite; and appeals of members convicted in an annual conference, when those of 3 must unite. Its decisions are final, except that law questions may be reviewed by

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the general conference. The powers of the 'Annual Conferences' are merely administrative. A bishop presides if present, and they are composed of travelling preachers, who are responsible to them, and whose characters are examined each year. Their action is subject to review by the general conference. 'District Conferences' consist of the presiding elder, pastors, local preachers, exhorters, and one steward and Sunday-school superintendent from each charge in the district. The local preachers are licensed by and are responsible to them, being also recommended by them to the annual conferences for admission or ordination. This body also has the care of the general financial, educational, and benevolent interests of the district. The 'Quarterly Conference' is composed of the pastors, local preachers, exhorters, stewards, class-leaders, trustees, and Sunday-school superintendents of a single charge, over which it has supervision. The pastor, class leaders, and stewards of each charge constitute its leaders' and stewards' meeting, which cares for the sick and poor, superintends the discipline, and can recommend for membership and for license to preach or exhort. The membership of each charge is divided into classes, each having its own leader. Besides presiding over the general and annual conferences, the bishops arrange the districts of the presiding elders, ordain deacons, elders, and newly elected bishops, annually station the preachers, and have the general supervision of the temporal and spiritual affairs of the church. Though they are not diocesan, but have a joint jurisdiction over the entire church, since 1872 they have to reside severally within certain districts into which the territory is divided. The presiding eldership is a kind of sub-episcopate, with the duty of oversight and administration in a limited sphere. Their intimate acquaintance with pastors and people in their several districts, and their presidency over the quarterly conferences, enable the presiding elders to be useful counselors and assistants to the bishops, especially in making ministerial appointments. In this work, custom has made them the bishops' advisers, though they have no actual authority in the matter, the bishops alone being responsible for all appointments. Candidates for the ministry, after two years' probation in itinerant work, and a satisfactory examination in certain prescribed studies, may be admitted to a general conference and ordained deacons. After two years' further trial, they may be ordained elders. Before a candidate for the ministry can be received into full membership he is asked certain questions in the presence of the conference, one of which is, 'Will you wholly abstain from the use of tobacco?' Deacons administer baptism, solemnize marriage, assist elders in administering the Lord's Supper, and perform all the duties of a travelling preacher. Elders, besides all these, also administer the Lord's Supper. Except in this last prerogative, deacons, elders, and preachers have the same functions, and may have charge of a circuit or station. The pastor is the chief executive

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of the local church; has the care of its interests according to the requirements of the discipline; and is responsible to the annual conference for his ministerial fidelity and his moral character and conduct. Class-leaders are sub-pastors having special oversight of the various classes, with whom they have weekly devotional meetings; they are in subordination to the pastor. Local preachers are members of district and quarterly conferences, and are often useful adjuncts to the 'itinerancy' as a self-supporting body of lay ministers and evangelists. Admission to church-membership is granted after 6 months or more of satisfactory probation; members from other churches are admitted by certificate without probation. Each local society owns its church building, parsonage, etc., which are held by trustees lawfully constituted. A peculiarity in the constitution of the church, which it shares with most other Wesleyan churches, is the 'itinerant system' of limited pastorates. It was instituted by Wesley, and is still in vogue, though it has been considerably modified in recent years. At first, there being many more societies than preachers, Wesley divided the territory into 'circuits,' each comprising a certain number of societies, and appointed a preacher, or 'helper,' for each circuit. Preachers and circuits were changed at first semi-annually, then annually. All appointments are still made each year, but a pastor cannot be appointed to the same charge for more than five years in succession. This five year time limit was established by the general conference of 1888. From 1864 to 1888 the time limit was three years, and for some years prior to 1864 the limit had been two years. In the work of evangelization the church has from the beginning been among the pioneers, everywhere keeping pace with the march of population, and usually being the first to appear in every new field. Equally rapid have been its internal development and the establishment and growth of the various denominational institutions demanded by the times and circumstances. One of the first Sunday schools in the country was organized, 1786, by Bp. Asbury; and, 1790, its conference ordered such schools for the instruction of 'poor children, white and black, in learning and piety,' to be generally established. The Missionary and Bible Soc. of the M. E. Church in America was a result of the labors of John Stewart among the Wyandotte Indians of Ohio in 1816: it was organized in New York city 1819, Apr. 5; incorporated by legislature of N. Y., 1839, Apr. 9; and became a church board 1872. The following are statistics of this soc. (1895): Members in foreign field 147,203, a gain of 61 per cent. since 1891; Sunday-school scholars 154,267; value of church property \$2,581,703; missionaries 449; native ordained preachers 661; native unordained preachers 1,159; local preachers and helpers 1,651; collections for self-support \$348,553. The soc. also aided in the support of 4,000 domestic missionaries in the U. S. The receipts of the soc. for 1820, its first year, were \$823.04; in 1896, \$1,149,596; annual average for ten years 1887-96, \$1,055,172. The Woman's Foreign Missionary Soc. was organized in Boston, Mass., 1869, March 23; ap-

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proved by General Conference 1872; incorporated 1884, Dec. 27. This soc. has fields of work in China, Japan, Korea, Malaysia, Burmah, India, Bulgaria, Italy, Mexico, and S. America, and had (1896) missionaries 170; societies 5,808; members 150,114; contributions \$285,824. The Woman's Home Missionary Soc., whose field is in the United States, was organized 1880, and had (1896) members 69,120, and property valued at \$482,300. The Sunday School Union was formed in New York 1827, Apr. 2; merged with the 'Bible S. S. Union and Tract Soc.' 1833; reorganized by Gen. Conf. 1840; incorporated by the legislature of N. Y. 1852, Feb. 4, and charter amended 1864, Apr. 11. The S. S. Union had (1895) schools 30,259; officers and teachers 352,627; scholars 2,585,178 (an increase of 9 per cent. since 1891); conversions 132,697; books and papers circulated in foreign field 49,597,884 pages. The Tract Soc. was organized by Gen. Conf. 1852. In 1895 this soc. printed 1,522,100 tracts, amounting to 10,401,000 pages. The Board of Church Extension was organized by Gen. Conf. 1864, May 27. Its report (1896) shows during the past 12 years, \$2,038,830 collected, and nearly 12,000 new churches built. The Freedmen's Aid and Southern Education Soc. began its work among the refugees and freedmen during the civil war. In 1896 this soc. maintained colored schools 22, with teachers 217, students 4,881; white schools 22, with teachers 145, and students 3,458; total value of property \$1,978,800; receipts \$214,071. The Board of Education is the outcome of the observance of the centennial year of the church in 1866, and was chartered 1869. Report for 1896 shows students assisted 1,631, about three-fourths of whom are preparing for ministerial and missionary work; total number aided from its beginning 7,330, to the amount of \$677,682.

The church maintains ten orphan asylums and institutions for children; five homes for the aged; and ten hospitals. The Deaconess work of the church originated 1887, and there were (1896) 23 homes and institutions in America, and 17 in Europe, Asia, and Africa. The National Assoc. of Local Preachers was organized in New York 1858, Oct. 4; had (1896) a membership of 300, and owns Taylor Univ., Upland, Ind., which had (1896) 207 students.

The educational institutions of the church are (1896): Theological schools 20, with instructors 82, students 858, value of grounds and buildings \$837,636; endowments \$1,698,652; debt \$15,000. Colleges and universities 54; instructors 1,616; students 24,159; value of grounds and buildings \$11,084,343; endowments \$10,845,298; debt \$1,005,778. Classical seminaries: instructors 484; students 10,083; value of grounds and buildings \$2,686,402; endowments \$673,581; debt \$263,594. Institutions exclusively for women 67; instructors 149; students 1,012; value of grounds and buildings \$405,000; endowments \$87,000; debt \$45,000. Foreign mission schools 74; instructors 553; students 8,014; value of grounds and buildings \$944,524; endowments \$34,495; debt \$24,380. Missionary institutes and Bible training schools 4; instructors 55; students 267; endowments \$20,000. Total: instructors 2,939; students 44,393; value of grounds and buildings \$16,179,905; en-

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dowments \$13,359,026; debt \$1,356,252. The American Univ. at Washington, D. C., incorporated 1893, is designed to secure the best and highest instruction in post-graduate and professional courses of study. Assets (1896), including property and funds and endowments in hand and pledged, \$1,040,000. The univ. buildings will occupy the site of Fort Gaines, comprising 90 acres of ground on an eminence four miles from the capitol; the corner-stone of the first of its 26 projected structures, the College of History (to cost \$158,000), was laid 1896, Oct. 21.

The general conference of 1892 created a university senate and empowered it to determine the minimum equivalent of academic work in the educational institutions of the church for graduation to the baccalaureate degree. The senate is composed of 15 educators appointed by the board of education, one from each General Conference district and one at large. It reports quadrennially to the board of education, and that board determines what institutions meet the requirements prescribed by the university senate. The institutions so adjudged can alone be officially recognized by the church as colleges or universities.

The church has publishing houses at New York and Cincinnati, with branches at Boston, Pittsburg, San Francisco, Detroit, Chicago, and St. Louis. Since 1844 the total sales have reached \$60,679,380. The official periodicals of the church number 27 weekly, monthly, and quarterly publications, besides a large list of semi-official and unofficial ones.

The official statistics of the M. E. church for 1896 are as follows: Conferences 124; mission conferences 9; missions 12; bishops 21; churches 25,849, valued at \$109,641,191; parsonages 10,059, valued at \$16,880,417; ministers 17,234; local preachers 14,686; lay members and probationers 2,825,694; baptisms, children 88,360, adult 118,315; Sunday schools 30,849, officers and teachers 355,899, scholars 2,607,241. Total contributions of the church for all purposes (1895) \$22,072,224, averaging per member about \$8. Total indebtedness on church property (1895) \$10,894,156.

The church gained in membership (1896) 2 per cent. over 1895 and 25 per cent. over 1890. The membership is distributed over every state and territory of the Union, with organizations in 2,205 counties out of a total of 2,790. The various allied bodies of Methodists constitute about one-fourteenth of the entire population of the United States.

The church has no prescribed ritual. Although it sets forth a ritual for use at discretion, the utmost liberty is allowed; so that, while in some churches there is an approach to liturgical forms, in the most there is great simplicity, with free prayer, congregational singing, and participation by the laity, male and female, in the devotional services.

On all moral questions the church has always taken advanced ground. It prohibits its members from 'buying, selling, or using intoxicating liquors as a beverage, signing petitions in favor of granting license for the sale of intoxicating liquors, becoming bondsmen for persons

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engaged in such traffic, renting property as a place in or on which to manufacture or sell intoxicating liquors, dancing, playing at games of chance, attending theatres, horse races, circuses, dancing parties, or patronizing dancing schools, or taking such other amusements as are obviously of misleading or questionable moral tendency.' In 1784, it declared slavery contrary to the law of God and to the principles of the American revolution, and measures were considered for 'eradicating this enormous evil from that part of the church of God to which we are united.' In 1808 slaveholders were declared ineligible to the office of elder; and, 1816, this ineligibility was extended to all officials. It was on this question of slavery that the division occurred which resulted in the organization of the Meth. Episc. Church, South (q.v.), 1845. During the late civil war the church was positive and outspoken in its official utterances in support of the union, and more than 100,000 of its members entered the Federal armies. The progress and influence of the Meth. Episc. Church have been among the chief religious phenomena of the century.

METH'ODIST EPIS'COPAL CHURCH, SOUTH. At the general conference of the Meth. Episc. Church, 1844, two ministers were suspended from office for being slaveholders. Thereupon 13 annual conferences remonstrated through their delegates, on the ground that such action must make the jurisdiction of the general conference over the conferences in the slaveholding states inconsistent with the success of the ministry there. A committee then drew up a plan for a peaceful division of the church. 1845, May 1, a convention of the slaveholding conferences met at Louisville, Ky., and organized the Meth. Episc. Church, South. It also provided for a meeting of the first general conference, which took place at Petersburg, Va., 1846, May. There the plan of division presented by the conference committee of 1844 was approved, and the property belonging to the whole church was equitably divided according to that plan and with the sanction of the U. S. supreme court. The church has a publishing house at Nashville, Tenn., and a flourishing missionary society. Before the civil war it published 1 quarterly, 2 monthly, and 8 weekly periodicals; and had 21 colleges for males, and 55 collegiate and academic institutions for females. At its organization it claimed a membership of about 450,000, which by 1860 had increased to 964,971, of whom 207,766 were colored. Through the war not only was its membership largely reduced, but its educational, publishing, and missionary interests were crippled and almost destroyed. Much of its property was used by others, some was destroyed, but most has been restored since the war, and the church is rapidly regaining prosperity. In doctrine and polity it is very similar to the Meth. Episc. Church, though a few changes have been made. Its general conference consists of an equal number of clerical and lay delegates. The annual conferences are composed of itinerant preachers and 4 lay delegates, one of whom may be a local preacher, from each district. In 1872 the publishing house was

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burnt down but was soon rebuilt on a much larger scale. Its sales for 1896 amounted to \$350,512.

The General Conference organized a General Missionary Soc. in 1846. The fields of labor are in China, Japan, Brazil, Mexico, and Korea; and reports for 1896 are as follows: Missionaries 57; wives of missionaries 49; native travelling preachers 99; native local preachers 108; members 9,853; Sunday schools 233, officers and teachers 608, scholars, 7,294; Epworth leagues 36, members 1,194; schools 62, pupils 2,018; total value of missionary property \$246,262. The Indian mission had (1896) preachers 138; local preachers 186; white members 15,405; Indian members 4,111. The Woman's Foreign Missionary Soc., was organized 1878, May, has fields in China, Mexico, Brazil, also the Indian mission; with (1896) missionaries 45; teachers 112; boarding schools 12; day schools 42; hospitals 2. The Board of Church Extension was organized 1882, besides which each annual conference has an auxiliary church extension board, and city boards of extension may be organized in cities that have three or more pastoral charges. The Woman's Parsonage and Home Mission Soc. was formed to aid in building parsonages, and for general educational and religious work. The Board of Education has (1896) nearly 200 schools of all grades under its care, with more than 1,000 teachers and 16,000 pupils, and property valued at \$5,000,000, with endowments of \$2,500,000.

The general statistics of this church for 1896 are as follows: Bishops 9; travelling preachers 5,538; local preachers 5,875; members 1,449,133—an increase of 9 per cent. over the past year, and the membership has trebled since 1866; Sunday schools 13,873, teachers 99,338, scholars 811,579; Epworth leagues, 3,153, members 141,840; membership of Junior leagues 13,500. The contributions of the church were (1895): Conference claimants \$131,826; foreign missions \$215,816; domestic missions \$130,920; presiding elders \$281,080; preachers in charge \$2,019,551; bishops \$36,843; total \$2,816,036.

The Colored M. E. Church in America had (1896) churches 4,009; preachers 1,680; members 64,308.

METH'ODIST PROTESTANT CHURCH: organized 1830 by former members of the Meth. Episc. Church, who for some time previously had expressed dissatisfaction with the government of the church, which they declared was too exclusively in the hands of the itinerant preachers, to the exclusion of other preachers and the lay membership. To effect a change in this respect they published *The Wesleyan Repository* 1820-24, and presented numerous petitions to the general conference 1824. After the meeting of conference they resolved to publish another periodical for the discussion of the question at issue, and also organized themselves, in Baltimore, into a union society, with the recommendation that others be organized throughout the church, for the purpose of ascertaining how many members were in favor of a change in its government. Some of the agitators

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were thereupon expelled from the church, 11 ministers and 22 laymen in Baltimore being among the number. These at once organized, under Wesley's general rules, with the title of the 'Associated Methodist Reformers, 1827, Nov. They petitioned the general conference 1828, for a change in the government, making it more representative, but were refused. Thereupon they withdrew from the church in large numbers in various parts of the country, and called another general convention of the reformers in Baltimore, 1828, Nov. 12, at which a provisional government was formed; and at the Baltimore convention 1830, Nov. a constitution and discipline for the government of the Meth. Prot. Church were adopted. The church agrees with the Meth. Episc. Church in doctrine, but differs in government. Its general conference meets quadrennially, and consists of delegates elected by the annual conferences, one minister and one layman being chosen for every 1,000 members. It has power to make rules of government; to determine the duties and compensation of itinerant ministers and other officers; to devise ways and means for raising funds; and to fix the boundaries of the annual conferences. The church having no bishops, the conference is presided over by an elected chairman. The annual conference consists of all the ordained itinerant ministers in the district; elects to orders; stations preachers and missionaries; makes rules for their support; and fixes the boundaries of circuits and districts. The quarterly conference is composed of the trustees, preachers, exhorters, leaders, and stewards of a district, and examines the character of its members; licenses preachers; and recommends for ordination. The classes, leaders, stewards, are the same as in the Meth. Episc. Church. In 1858 the anti-slavery party in the church withdrew from the general conference at Baltimore and formed themselves into the 'Methodist Church,' with head-quarters at Springfield, O., afterward removed to Pittsburg, Penn. In 1877 the two bodies reunited at Baltimore, under the original name of the Meth. Prot. Church. As reported in May, 1896, the church has: ministers and preachers, 1,550, an increase of 65 over 4 years ago; unstationed ministers and preachers, 1,116, decrease of 9; members of the church, 179,092, an increase of 37,821; probationers, 4,624, an increase of 504; number of churches, 2,267, an increase of 86; number of parsonages, 484, an increase of 79; value of church property, \$4,519,357, an increase of \$967,998. This does not include the value of the college property. The church has 2,018 Sunday schools, with 17,567 officers and teachers, and 107,490 pupils; 595 Christian Endeavor societies, with a membership of 27,693.

Its leading periodical publications are *The Methodist Recorder*, Pittsburg, Penn., and *The Methodist Protestant*, Baltimore, Md. Its principal educational institutions are: Adrian College, Adrian, Mich., organized 1859, with (1895) 15 instructors and 250 students, and Western Maryland College, Westminster, Md., organized 1867, with 17 instructors and 260 students.

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METH'ODISTS (British): name originally given, about 1729, by a student of Christ-Church to the brothers John and Charles Wesley, and several other young men of a serious turn of mind, then members of different colleges of Oxford, who used to assemble together on particular nights of the week chiefly for religious conference. The term was an allusion to the exact and *methodical* manner in which they performed the various engagements which a sense of Christian duty induced them to undertake, such as meeting together for the study of Scripture, visiting the poor, and prisoners in Oxford jail, at *regular* intervals. Subsequently, it came to be applied to the followers of Wesley and his coadjutors, when these had acquired the magnitude of a new sect; and though their founder himself wished that 'the very name,' to use his own words, 'might never be mentioned more, but be buried in eternal oblivion,' yet it has finally come to be accepted by most, if not all, of the various denominations that trace their origin mediately or immediately to the great religious movement commenced by John Wesley. For an account of the origin and earlier development of Methodism, see WESLEY, JOHN: WESLEY, CHARLES: WHITEFIELD, GEORGE. The present notice concerns its organization, doctrine, and present condition.

1. *Organization.*—This appears to have been partly improvised by Wesley to suit the exigencies of his position. It was not a theoretical and premeditated, but a practical and *extempore* system. In the *Rules of the Society of the People called Methodists*, drawn up by himself, he says: 'In the latter end of the year 1739, eight or ten persons came to me in London, who appeared to be deeply convinced of sin, and earnestly groaning for redemption. They desired (as did two or three more the next day) that I would spend some time with them in prayer, and advise them how to flee from the wrath to come, which they saw continually hanging over their heads. That we might have more time for this great work, I appointed a day when they might all come together, which from thenceforward they did every week—viz., on Thursday, in the evening.' This he calls 'the first Methodist Society.' Its numbers rapidly increased, and similar 'societies' were soon formed in different parts of England, where the evangelistic labors of the Wesleys had awakened in many minds 'a desire to flee from the wrath to come, and be saved from their sins'—the only condition, we may remark, required of any for admission into these societies. In order to ascertain more minutely how the work of salvation was progressing in individual cases, Wesley subdivided the societies into 'classes,' according to their respective places of abode, each class containing about a dozen persons, under the superintendence of a 'leader,' whose duties are partly religious and partly financial. 1. He has to see each person in his class once a week, 'to inquire how their souls prosper,' and to encourage, comfort, or cen-

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sure, as the case may require. 2. To collect the voluntary contributions of his class, and pay them over to the 'stewards' of the society, and to give the ministers all necessary information regarding the spiritual or bodily condition of those under his leadership. For preaching purposes, on the other hand, the societies were aggregated—a certain number of them constituting what is called a circuit. This now generally includes a town, and a rural circle of 10 or 15 miles. To each circuit, two, three, or four ministers are appointed, one of whom is styled the 'superintendent;' and here they labor for at least one year, and not more than three. Every quarter, the classes are visited by the ministers, who make it a point to converse personally with every member; at the termination of which proceeding, a 'circuit-meeting' is held, composed of ministers, stewards, leaders of classes, lay preachers, etc. The stewards (who are taken from the societies) deliver their collections to a circuit-steward, and the financial business of the body is here publicly settled. At this quarterly meeting, candidates for the office of the ministry are proposed by the president, and the nomination is approved or rejected by the members. Still larger associations are the 'districts,' composed of 10 to 20 circuits, the ministers of which meet once a year, under the presidency of one of their number, for the following purposes: 1. To examine candidates for the ministry, and to 'try cases of immorality, heresy, insubordination, or inefficiency on the part of the clergy.' 2. To decide preliminary questions concerning the building of chapels. 3. To investigate and determine the claims of the poorer circuits to assistance from the general funds of the body. 4. To elect a representative to the committee of Conference, whose duty is to nominate ministers for the different stations for the ensuing year—their appointments, however, being subject to the revision of Conference. In all the financial and other purely *secular* business of the districts, laymen (such as circuit-stewards and others) deliberate and vote equally with the clergy. The supreme Methodist assembly is the 'Conference.' The first was held 1744, when John Wesley met his brother Charles, two or three other clergymen, and a few of the 'preachers'—men whom his zeal and fervor had induced to abandon their secular employments and devote themselves to declaring the message of the Gospel. The purpose for which he called them together was, he says, 'for the sake of conversing on the affairs of the "societies," . . . and the result of our consultations we set down to be the rule of our future practice.' In the course of his life, Wesley presided at 47 of these annual assemblies. The Conference now consists of 100 ministers, mostly seniors, who hold their office according to arrangements prescribed in a Deed of Declaration, executed by John Wesley himself, and enrolled in chancery. But the representatives previously mentioned, and all the ministers allowed by the

district committees to attend—who may or may not be members of the legal Conference—sit and vote usually as one body, the 100 confirming their decisions. In this assembly, which is exclusively clerical, every minister's character is subjected to renewed and strict scrutiny, and if any charge be proved against him, he is dealt with accordingly; candidates for the ministry are examined both publicly and privately, and set apart to their sacred office; the entire proceedings of the inferior courts (if we may so call them) are finally reviewed; and the condition, requirements, and prospects of the body are duly considered.

2. *Doctrine and Worship.*—Wesleyan M. claim to be *orthodox, Protestant, and evangelical*. The propriety of the last two appellations will probably not be disputed, but a rigid Calvinist might object to the first. They accept the *articles* of the English Church, but believing these articles to have been framed on a basis of *comprehension*, they consider themselves at liberty to accept them in an Arminian sense. It must not, however, be supposed that they are out-and-out Arminians. Their great distinguishing doctrine is the universality and freedom of the atonement; hence, they reject the Calvinistic doctrine of predestination and especially of reprobation (which they conceive incompatible with the universal atonement); but while they maintain the freedom of the will and the responsibility of man, they maintain also his total fall in Adam, and his utter inability to recover himself. If these two appear to the human understanding to conflict, it is nevertheless asserted that the Bible teaches both; and it is objected to high Calvinism, that, in its anxiety to be logical, it has shown itself unscriptural. Prominence is given by the Wesleyan M. to certain points of religion, some of which are not altogether peculiar to them. They insist on the necessity of men who profess to be Christians feeling a *personal interest* in the blessings of salvation—i.e., the assurance of forgiveness of sins and adoption into the family of God. This, however, is not to be confounded with a certainty of *final salvation*. They believe the Spirit of God gives no assurance to any man of that, but only of *present pardon*. In harmony with this view, they reject the doctrine of the necessary perseverance of the saints, and hold that it is fearfully possible to fall from a state of grace, and even to perish at last after having 'tasted of the heavenly gift,' and having been 'made partakers of the Holy Ghost.' They also maintain the perfectibility of Christians, or rather the possibility of their entire sanctification, as a privilege to be enjoyed in this life. But Wesley 'explains' that 'Christian perfection does not imply an exemption from ignorance or mistake, infirmities or temptations; but it implies the being so crucified with Christ as to be able to testify, "I live not, but Christ liveth in me."' He regards the sins of a 'perfect' Christian as 'involuntary transgressions,' and does not think they should be called 'sins' at all, though

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he admits that they need the atoning blood of Christ. The Wesleyan M. in their religious services use more or less the English liturgy; the morning service being read in many of their chapels, and the sacramental offices being required in all. They observe a 'watch-night' on the eve of the New Year, on which occasion the religious services are protracted till midnight, and their chapels are generally crowded to excess; and in the beginning of the year they hold a 'covenant-service,' at which congregations stand up (though this form is not invariable), and solemnly vow to serve the Lord. But even the ordinary religious services in some places are frequently marked by an ebullition of fervent feeling on the part of the audience, which has a very singular effect upon a stranger.

3. *History.*—The earlier history of Methodism was for many years the history of Christian effort to evangelize the neglected 'masses' of England. The noble labors of Wesley, and of those whom he inspired to imitate his example, met remarkable success. The reformation of life which his preaching produced, for example, among the Kingswood colliers and the Cornwall wreckers, is a testimony to the power of religion which cannot be too highly estimated. The zeal which has inspired the body in regard to foreign missions, although in the highest degree honorable, is only the logical development of their efforts at home—for they originally regarded their society in England as simply a vast 'home mission,' and neither Wesley nor his followers desired to consider themselves a 'sect,' a new church, in the common usage of the term, but were warmly attached to the old national church, and considered themselves among her true children. When Wesley died (1791), his 'societies' had spread over the United Kingdom, the continent of Europe, the United States, and the W. Indies, and numbered 80,000 members. Since then, they have largely increased, official statistics of 1896 being as follows: For Great Britain, ministers 2,127; members 466,711—a slight loss since 1895; Ireland, ministers 231; members 27,576. Other Methodist bodies in Great Britain and Ireland comprised ministers 2,434; members 373,700. Australia had ministers 661; members 97,730. The number of adherents over the world is estimated at about 19,000,000. The annual contributions for purely Methodist purposes in Great Britain average £2,500,000.

The Wesleyan M. have three theological colleges for the training of ministers—one at Richmond Hill, Surrey, a second at Didsbury, s. Lancashire, and a third at Headingley, in Yorkshire, besides the establishments at Sheffield and Taunton; two schools for education of sons of Wesleyan ministers (New Kingswood School and Woodhouse Grove School); and two for the daughters, one at Clapton and another at Southport. The boys receive a six years' and the girls a four years' course of instruction. Attention is given also to elementary education, and their schools received 1879 a govt. grant of

£96,700. The Methodist Book-room is in the City Road, London, and issues hundreds of thousands of religious publications (tracts, etc.) monthly. The newspapers and other periodicals professedly in connection with the body include four quarterlies and about 150 journals in English and other languages. Among the more eminent Methodist authors may be named the two Wesleys, Fletcher, Benson, Clarke, Moore, Watson, Drew, Edmondson, Sutcliffe, Jackson, Treffry, Rule, Nichols, Smith, and Etheridge.

The corresponding denomination in the United States, one of the greatest of Prot. denominations, is the **METHODIST EPISCOPAL CHURCH (q.v.)**. Also, see other "METHODIST" denominations under their titles: also **WESLEYAN METHODIST CONNECTION of America: AFRICAN METHODIST EPISCOPAL CHURCH: AFRICAN METHODIST EPISCOPAL ZION CHURCH**.

Returning to the English Wesleyan M., we notice the various secessions from the parent body in the order of time:

1. **METHODIST NEW CONNECTION**.—This society detached itself from the older one 1797. Its founder was Alexander Kilham (1762–98), who was received by Wesley into the regular itinerant ministry 1785. When, after Wesley's death, there was controversy whether the Wesleys should continue their submission to the established church, Kilham urged that they should administer the sacraments as well as preach the word, and that they should separate entirely from the Church of England. Kilham urged also admission of the lay element to a share in government. The controversy grew acrimonious, and resulted in his expulsion from the society, and the formation of the New Connection. Its doctrines and order are the same as those of the old, the only difference being that it admits one layman to each minister into the Conference, and allows them to share in the transaction of all business, both secular and spiritual. These laymen are chosen either by the circuits or by 'guardian representatives' elected for life by the conference. In 1896 the numbers of the New Connection were members and probationers 37,102; preachers 200.

2. **PRIMITIVE METHODISTS**, vulgarly designated **RANTERS**, were first formed into a society 1810, though the founders had separated from the old society some years before. The immediate cause of this separation was a disagreement as to the propriety of camp-meetings for religious purposes; and also on the question of females being permitted to preach. A third point of difference is the admission to their conference of two lay delegates for every minister. In 1896 there were 196,628 members and probationers, 1,113 ministers.

3. **INDEPENDENT METHODISTS**, who separated 1810; distinguished chiefly by their rejection of a paid ministry. They number in England and Scotland: members, 4,000; preachers, 290; scholars, 6,000.

METHOMANIA—METHOUGHT.

4. **BIBLE CHRISTIANS**, called **BRYANITES** also, were formed by a local preacher named Bryan, who seceded from the Wesleyans 1815. The only distinction between them and the original body appears to be that the Bible Christians receive the eucharistic elements in a sitting instead of kneeling posture. In 1896 their numbers were, members and probationers 34,304; preachers 295.

5. **UNITED FREE CHURCH METHODISTS** have been recently formed by the amalgamation of two sects of nearly equal numerical strength. The older of these, the **WESLEYAN ASSOCIATION**, originated 1834 in the removal of one or two influential ministers from the original connection. Points of difference subsequently appeared with regard to the constitution of the Conference.—The younger sect, the **WESLEYAN REFORM ASSOCIATION**, took its rise 1849, through the expulsion of several ministers from the parent body on a charge of insubordination, and being founded on the same principles as the last-mentioned community, arrangements were entered into for their union, which was subsequently effected. Church independency and freedom of representation in the annual assembly are two of the prominent distinctive traits in the organization of the *United Methodist Free Church*. Their united numbers in 1896 were, members and probationers 89,618; ministers 417.—The *Wesleyan Reform Union* consists of 16 ministers and 7,400 members, who have not amalgamated with the Methodist Free Churches.

WELSH CALVINISTIC METHODISTS are not a secession from the followers of Wesley, but originated partly in the preaching of his friend and fellow-evangelist, Whitefield, and partly in that of Howel Harris, a Welsh clergyman of the Church of England. Whitefield was a Calvinist; Wesley was on some points decidedly Arminian. A difference arose between them on the subject of election, and thenceforward their paths lay in different directions. Whitefield, however, did not form a religious sect; and after his death (1769), his followers, being left without any distinct bond or organization, either followed the leading of the Countess of Huntingdon (q.v.), or became distributed among other denominations, a large portion, especially in Wales, becoming absorbed in the new society gradually forming itself through the preaching of Howel Harris and his coadjutors. They became a separate body 1810, and have now about 130,000 communicants: see **CALVINISTIC METHODISTS**.

The *Canadian Methodist Church* had (1896) ministers and preachers, 2,054; members and probationers 272,392; Sunday schools, 3,349; officers and teachers, 25,789; scholars 262,915.

METHOMANIA: see **DIPSOMANIA**.

METHOUGHT: see under **METHINKS**.

METHUEN—METHYL.

METHUEN, *mě-thū'én*: thriving town in Essex co., Mass.; 2 m. from Lawrence, 24 m. from Manchester, on a railroad connecting these cities. Its n. portion joins N. H., and the Merrimac river forms part of its s. boundary. It has a street railroad to Lawrence and North Andover. The Spicket river supplies abundant water power. Cotton and woolen goods, hats, and shoes are manufactured. There are four churches, a high school, library, and a national bank, Pop. (1900) 7,512.

METH'UEN TREATY: commercial treaty negotiated 1703 by Mr. Methuen, English ambassador in Portugal, to admit Portuguese wines to England at a duty one-third less than that on French wines.

METHYL, n. *měth'íl* [Gr. *methu*, wine; *hulē*, material]: the hydrocarbon radical of methylic alcohol, being a colorless inflammable gas burning with a luminous flame. **METHYLAMINE**, n. *mě-thíl'a-mĭn*, ammonia in which one atom of hydrogen is replaced by methyl (see **METHYL**, below). **METHYLATED**, a. *měth'ĩ-lāt-ĕd*, impregnated or mixed with methyl. **METHYLENE**, n. *měth'ĩ-lĕn*, a highly volatile and inflammable liquid procured from the destructive distillation of wood (see **METHYLENE**, **BICHLORIDE OF**). **METHYLIC**, a. *mě-thíl'ík*, of or pertaining to methyl.

METH'YL: organic radical homologous with Ethyl (q.v.), being the lowest term in the series C_nH_{2n+1} , n in this case being equal to 1. Its formula is CH_3 .

Like ethyl, it forms a very numerous class of compounds, of which the following are the most important: *Hydride of Methyl* ($CH_3.H$), known as *Methane* or *Light Carburetted Hydrogen* (q.v.), *Marsh-gas*, and *Fire-damp*, may be obtained either naturally or artificially. As a natural product, it sometimes issues from fissures in coal-seams, rushing forth as if under high pressure. These discharges of this gas are termed 'Blowers' by the miners, and it is by the combustion of this fire-damp that the terrific explosions in coal-pits are caused. For its combustion, twice its volume of oxygen (consequently ten times its volume of air) is required; the resulting compounds being one volume of carbonic acid and two of steam. The vitiated air thus produced, utterly unfit for respiration, is known as the *after-damp* or *choke-damp*, and is as much dreaded as the explosion itself. *Hydride of M.* is also one of the gaseous exhalations from marshes and stagnant pools; and the bubbles that rise to the surface when the mud at the bottom of a pond is stirred up consist chiefly of this gas. It may be prepared artificially by strongly heating a mixture of crystallized sodium acetate, potassium hydrate, and powdered quicklime. It is a colorless, inodorous, tasteless gas, which may be breathed without apparent injury if well diluted with air. *Methyl Hydrate* ($CH_3.OH$), known also as *Methylic Alcohol*, *Wood Spirit*, and *Pyroxylic Spirit* (under which title its properties are described), is the strict homologue of vinous or ethylic alcohol ($CH_5.OH$).

METHYLATED SPIRIT.

Oxide of Methyl (CH_3O), or *Methylic Ether*, corresponds to the ordinary, or, correctly speaking, the ethylic ether, and, like the latter, is produced by distillation of a mixture of methylic alcohol and sulphuric acid. Oxide of M., like oxide of ethyl, combines with acids to form a class of ethereal salts, or compound ethers, as they are termed by some chemists—e.g., M. Acetate (or methylic-acetic ether), $\text{C}_2\text{H}_3\text{O}_2\cdot\text{CH}_3$; M. Butyrate (or methylic-butyric ether), $\text{C}_4\text{H}_7\text{O}_2\cdot\text{CH}_3$; M. Nitrate (or methylic-nitric ether), CH_3NO_3 ; M. Salicylate (or methylic-salicylic ether), $\text{CH}_3\cdot\text{C}_7\text{H}_5\text{O}_3$. The last-named compound may not only be obtained by distilling a mixture of pyroxylic spirit with salicylic and sulphuric acids, but occurs ready formed in the vegetable kingdom, constituting the essential oil procured from the *Betula lenta*, a species of birch, and from the *Gaultheria procumbens*, or *Winter Green*.

M. may be made to enter into combination with bromine, iodine, chlorine, and fluorine, the bromide and iodide of M. being colorless fluids, and the chloride and fluoride colorless gases. Among the most interesting of the numerous M. compounds are the artificial bases or alkalies, which can be obtained from ammonia by the substitution of one, two, or three equivalents of M. for one, two, or three of the equivalents of hydrogen contained in the ammonia.

If only one equivalent of hydrogen is replaced by M., the resulting compound is $\text{NH}_2(\text{CH}_3)$ or CH_5N , an extremely alkaline gas known as *methylamine*, more soluble in water than any other known gas; water at 55° dissolving 1,150 times its bulk. It is a frequent product of the destructive distillation of nitrogenous substances; and it is present when many natural alkaloids, such as narcotine and morphia, are distilled with caustic potash. The product resulting from the substitution of two equivalents of M. for two of hydrogen, and known as *dimethylamine*, closely resembles methylamine. When the three equivalents of hydrogen are replaced by three of M., the resulting compound is $\text{N}(\text{CH}_3)_3$ or $\text{C}_3\text{H}_9\text{N}$, a colorless gas known as *trimethylamine*, and having a disagreeable fishy odor. It occurs in large quantity in herring-brine, and has been detected in the spirit in which anatomical preparations have been long kept. Recently herring-brine has been proposed as a disinfectant for sewage; its efficacy depends largely on the presence of this compound. It is also found in *Chenopodium vulvaria* (Stinking Goose-foot), in the flowers of *Crataegus oxyacantha* (Common Hawthorn), and in ergot of rye.

METHYLATED SPIRIT: consists of a mixture of alcohol, of specific gravity 0.830, with ten per cent. of Pyroxylic (q.v.) or wood-spirit. This addition of wood-spirit renders it unfit for drinking, although it scarcely interferes with its power as a solvent: the addition is made in order that it may be allowed by the excise to be sold duty-free for manufacturing purposes and for preserving specimens in museums.

METHYLENE.

METH'YLENE, BICHLORIDE OF (CH_2Cl_2), more properly *Methene Chloride* or *Dichloromethane*: organic compound which has recently attracted much attention from its value as an anæsthetic agent. Dr. Richardson, who had long been studying the physiological properties of the methyl compounds, with the view of finding among them a safer compound than chloroform, believed, from his experiments on animals, that in M. he found such a compound. As the deaths from chloroform may be computed, according to him, at one in 1,500 administrations, it is obvious that there is reason for searching for a still safer anæsthetic agent. Dr. Snow, as is well known, thought that he had discovered an almost positively safe agent in amylene (C_5H_{10}); but the value of more than 200 safe administrations was at once destroyed by two rapidly succeeding deaths; and hence a large number of successful cases of the new agent must be reported before it will displace chloroform from its present well-deserved position. In the article on METHYL (q.v.), it is shown that the composition of hydride of methyl (methane, or marsh gas) is expressed by CH_3H , which may be written CHHHH . Now, according to the theory of substitutions, one, two, three, or even all four of the atoms of hydrogen may be replaced by a corresponding number of atoms of chlorine. Thus, (a) if one atom of H be replaced by one atom of Cl, we have *methyl chloride*, CH_3Cl ; (b) if two atoms of H be replaced by two atoms of Cl, the resulting compound is *methene chloride*, CH_2Cl_2 , the CH_2 here representing a radical termed methene, of which very little is known; (c) if three atoms of H be replaced by three atoms of Cl, the resulting compound is *terchloride of formyl*, CHCl_3 , or common chloroform, another radical, viz., formyl, CH , now appearing; (d) if the whole of the H be replaced by Cl, the resulting compound is *tetrachloride of carbon*, CCl_4 . We thus have four new bodies which may be constructed step by step out of methane, or marsh gas, and similarly, by starting with tetrachloride of carbon, the chemist may retrace the individual stages till he comes back to methane. All these derivatives of methane possess the power of producing anæsthesia when inhaled as vapor by men and animals. That the latter two—viz., chloroform and tetrachloride of carbon—possess this power has been long known; but that the first two exert the same influence is a fact new to science, for which we are indebted to Dr. Richardson, as reported by him in the *Med. Times*, 1867, Oct. 19.

M. is a colorless fluid, having an odor like that of chloroform; and is pleasant to inhale, as it causes little irritation to the mucous membrane. It boils at 88° , and has a spec. gr. of 1.344, while that of its vapor is 2.937 (or nearly three times that of air). Hence, it boils at a lower temperature than other anæsthetics; while its specific gravity, both as liquid and as vapor, is lower than that of chloroform, but much higher than that of ether; hence, from its easier evaporation, it requires more

free administration than chloroform, and, from its greater vapor-density, it should be given less freely than ether. It mixes readily with absolute ether, and this combination yields a vapor containing corresponding proportions of each, their boiling points differing at most by only 4° . It also combines with chloroform in all proportions. It should have a neutral reaction to test-paper. If a trace of acid be present—which is possible, but not probable—its inhalation might prove dangerous. To prevent decomposition, it should, like chloroform, be well guarded from the action of light.

Dr. Richardson, having fully tested this compound on pigeons, experimented with it on himself, with results which he regarded as highly satisfactory. 'On animals,' it acts more evenly on the respiration and circulation than any other of the various substances which Dr. Richardson has tried; and the only drawback yet observed is, that it sometimes produces vomiting; but this misadventure, so far as we know, has not yet been observed when it has been administered to the human subject, and pigeons are known to vomit on slight provocation. The numbers of the respirations and of the pulse rise and fall together, which "is a good point, because there is no condition more perilous than disturbed balance of the circulating and respiratory systems." All anæsthetics given by inhalation after a certain dose destroy life; but that the destructive power of this new agent is less than that of either chloroform or tetrachloride of carbon Dr. Richardson, after many experiments, considered proved. He reports that there is little difference required for its administration from that of chloroform. A little more bichloride is required in the earlier stages than when chloroform is used, the fluid being more vaporizable. One drachm of bichloride to 40 minims ($\frac{2}{3}$ of a drachm) of chloroform represents the difference required; but when the narcotism is well set up, less of the bichloride is required to sustain the effect. In an address on Anæsthetics by Dr. Tidy, published in the *British Medical Journal*, 1879, Jan. 4, it is mentioned that Mr. Morgan, a dentist, has administered methylene 1,800 times to persons of all ages, and for periods varying from a few minutes to three-quarters of an hour, without a single accident. He also regards it as safer than chloroform. The cause of death from its administration is syncope, not coma; hence, a bloodless condition of the lips—a point easily to be noticed—is the principal indication of danger.

On the other hand, the preliminary report on the action of anæsthetics presented to the committee of the British Medical Assoc., published in the same number of the *Journal*, does not speak so favorably of methylene. The so-called bichloride of methylene, it is alleged, has no definite and constant boiling point, and therefore appears to be a mixture. The formula, as now generally used, CH_2Cl_2 , shows it to be a compound of chloride of methyl and chloroform ($\text{CH}_3\text{Cl} + \text{CHCl}_3$). With frogs

METIC—METOPE.

under methylene it was found that the heart became rapidly affected and soon stopped. With rabbits, respiration rapidly deteriorated, and stopped while the heart was still beating. In an experiment with artificial respiration and exposure of the heart, the heart was weakened and soon stopped, but not as rapidly as with chloroform. As in the case of chloroform, the right ventricle became enormously distended, the first sign of paralysis being the commencement of the distention. [Ether does not affect the heart.] Experimenters found that, as anæsthetics, *Isobutyl Chloride* (C_5H_9) and *Ethidene Dichloride* ($C_2H_4Cl_2$) combine the advantages of speed and safety, and are therefore preferable to methylene.

Chloride of Methyl, the first of the compounds derived by substitution from hydride of methyl, also has, according to good authorities, valuable remedial qualities. Half an ounce of it, diluted with water, and with the addition of a little sugar, acts as a pleasant but potent intoxicator. In smaller doses, it might be useful as a soothing and refrigerating agent.

METIC, n. *mēt'ik* [Gr. *metoikos*, a settler, an alien—from *meta*, change; *oikos*, a house: L. *metæcus*, a stranger]: a sojourner; a resident stranger; an alien.

METIS, n. *mē'tis* [in Gr. and L. *myth.*, *Mētis*, the daughter of *Océānus*]: one of the asteroids or minor planets: see PLANETOIDS.

METOCHE, n. *mēt'ō-kē* [Gr. *metecho*, I am a partaker of]: in *arch.*, the interval or space between two dentils.

METONIC, a. *mē-tōn'ik* [from *Meton* (abt. B.C. 432), an Athenian, its discoverer]: epithet applied to the cycle of the moon. METONIC CYCLE or METONIC YEAR, a period of 19 years, at the end of which time the new moons fall on the same days of the year, and eclipses recur in nearly the same order. This arises from the fact that 19 solar years are nearly equal to 235 lunations, their average values being 6,939·68835 and 6,939·60249 days respectively.

METONYMY, n. *mēt'ō-nīm-ī* or *mēt-ōn'ī-mī* [L. *metonymiā*—from Gr. *metōnum'īā*, a change of name—from *meta*, over, change; *onōma*, a name: F. *métonymie*]: in *rhet.*, a figure of speech in which one word is substituted for another to which it has some relation—as a part for the whole, the effect for the cause, the abstract for the concrete—e.g., 'I have read Milton,' that is, his works; 'they have Moses and the prophets,' that is, their writings. This expressive figure is much used in proverbial and other pithy modes of speech. METONYMIC, a. *mēt'ō-nīm'ik*, or MET'ONYM'ICAL, a. *-ī-kāl*, used by way of metonymy; putting one word for another. MET'ONYM'ICALLY, ad. *-lī*.

METOPE, n. *mēt'ō-pē* [Gr. *metōpē*—from *meta*, with, between; *opē*, an opening]: in *arch.*, space, in the frieze of the Doric order, between the triglyphs—generally ornamented with figures, or bulls' heads, or pateræ.

METOPOSCOPY—MÈTRE.

METOPOSCOPY, n. *mět'ō-pös'kǒ-pǐ* [Gr. *metopon*, the forehead; *skopēō*, I view]: the pretended art of discovering the character or disposition of individuals by the features or lines of the forehead.

METRA, *mět'ra*: ingenious pocket-instrument, invented about 1858; combining the thermometer, climometer, goniometer, anemometer, level, plummet, scales, etc., so that, by its assistance, travellers or engineers can determine the dip of rocks, angles of crystals, temperature, rate of wind; can take levels of large surfaces, determine latitude, and a variety of other matters connected with physical science; and can at once record their observations.

MÈTRE, n. *mā'tr*, or **METER**, n. *mē'tēr* [F. *mètre*]: French unit of length. The M. is the basis of the 'metric' or modern French system of weights and measures: see **METRIC SYSTEM: DECIMAL SYSTEM**. The first suggestion of a change in the previous system dates as far back as the time of Philippe le Bel; but up till 1790, no important change had been effected. 1790, May 8, proposals were made by the French govt. to the British, for the meeting of an equal number of members from the Acad. of Sciences and the Royal Soc. of London, to determine the length of the simple pendulum vibrating seconds in lat. 45° at the level of the sea, with the view of making this the unit of a new system of measures. The British govt., however, did not give this proposal a favorable reception, and it was dropped. The French govt., impatient to effect a reform, obtained the appointment by the Acad. of Sciences of a commission composed of Borda, Lagrange, Laplace, Monge, and Condorcet, to choose from the following three, the length of the pendulum, of the fourth part of the equator, and of the fourth part of the meridian, the one best fitted for their purpose. The commission decided in favor of the last—resolving that the one ten millionth of a quadrant of the meridian (the distance from the equator to the pole, measured as along the surface of still water) be taken for the basis of the new system, and be called a 'mètre.' Delambre and Mechain were immediately charged with the measurement of the meridian between Dunkerque and Barcelona; and the result of their labors was referred to a committee of 20 members, nine of whom were French, the rest having been deputed by the governments of Holland, Savoy, Denmark, Spain, Tuscany, and the Roman, Cisalpine, Ligurian, and Helvetic republics. By this committee, the length of the mètre was found to be 443·296 Parisian lines, or 39·3707904 English inches; and standards of it and of the kilogramme (see **GRAM**) were constructed, and deposited among the archives of France, where they remain. Recent investigations of the ellipticity of the earth make it probable that the M. is not precisely what it was intended and supposed to be. An international commission of 30 independent states (opened 1870) decided that the possible error had no significance;

METRIA—METROLOGY.

and their deliberations resulted in an international bureau of weights and measures at Paris. The 'metric system' received legal sanction in France 1801, Nov. 2, and was made compulsory 1840; it was made legal, though not compulsory, in England 1864; and in the United States 1866, July 28. It has not, in the last two countries, made the rapid advance in popular use that its many undeniable advantages had rendered probable: the great annoyance in making so wide-reaching a change has hindered it. In scientific use, however, it has been largely adopted. The following are the multiples and fractions of the *mètre* which are in common use, expressed in English measure:

	English Inches.				
Millimètre,	·0393707904				
Centimètre,	·393707904				
Decimètre,	3·93707904	=	English Ft.	English Yards.	
METRE,	39·3707904	=	3·2808992	=	1·093633
Decamètre,	393·707904	=	32·808992	=	10·93633
Hectomètre,	3937·07904	=	328·08992	=	109·3633
Kilomètre,	39370·7904	=	3280·8992	=	1093·633
Myriamètre,	393707·904	=	32808·992	=	10936·33

From the *mètre*, the other principal units of measure and weight are at once derived. See ARE: LITRE: GRAM: FRANC.

METRIA, n. *mě'trī-ă* [Gr. *mētra*, the womb]: childbed or puerperal fever. METRIC, a. *mě'trīk*, of or belonging to the womb. METRITIS, n. *mē-trī'tis*, inflammation of the womb. METRALGIA, n. *mē-trāl'jī-ă* [Gr. *algos*, pain, grief], or METRODYNIA, n. *mě'trō-dīn'ī-ă* [Gr. *odūnē*, pain]: pain in the womb. METROPHLEBITIS, n. *mě'trō-flē-bī'tis* [Gr. *phleps*, a vein; *phlebos*, of a vein]: inflammation of the veins of the womb.

METRIC, a. *mě'trīk* [F. *mètre*, a measure]: denoting measurement. METRIC SYSTEM, system of weights and measures first adopted in France, the two most important points in which are—1, that it is a decimal system; 2, that the units of length, superficies, solidity, and weight are correlated, two data only being employed: the *metre*, and the weight of a cube of water whose side is the 100th part of a metre (q. v.).

METRIC: see under METRIA. METRICAL: see under METRE 1.

METRIST, n. *mě'trīst*: a writer or composer of verses; a versifier.

METROGRAPH, n. *mě'trō-grăf* [Gr. *metron*, a measure; *grapho*, I write]: an apparatus on a railway-engine which indicates at any moment the speed per mile at which the train is travelling, and the time of arrival and departure at each station.

METROLOGY, n. *mē-trōl'ō-jī* [Gr. *metron*, a measure; *logos*, discourse]: the science of weights and measures, or a treatise on them.

METRONOME—METROPOLIS.

METRONOME, n. *mět'-rō-nōm* [Gr. *metron*, a measure; *nomos*, a law; *nōmē*, division, partition]: small machine that measures and beats musical time, indicating the correct time or speed at which a musical composition should be played. Its invention, which in its rudiments is traceable as early as 1696, has been falsely ascribed to Mälzel 1815, inventor of the automaton trumpeter: see **AUTOMATON**. Mälzel only modified it. The test of a correct M. is, that when set at 60 it shall beat seconds. **METRONOMY**, n. *mē-trōn'ō-mī*, the measurement of time by an instrument.

METROPOLIS, n. *mē-tröp'ō-līs* [Gr. *mētrōpōlis*, a parent state, a chief city—from *mētēr*, a mother; *polis*, a city]: mother city; the chief city or capital of a kingdom or state; among *naturalists*, the district of greatest number, either of typical or of specific forms of plants and animals that exist within definite geographical limits. **METROPOLITAN**, n. *mět'rō-pōl'i-tān*, in *church law*, the bishop of a *metropolis*, or 'mother city,' with its church, from which other churches have branched off, and on which other episcopal cities are in some sense dependent. The title did not come into use before the 4th c.; but the office or function can be traced to an earlier date. The Council of Nice, 325, recognized it as ancient. It is conjectured with some probability that the function, at least in its rudiments, was in existence at the middle of the 2d c. The attempt to trace it to the New Testament has not succeeded: it has discovered only that the apostles, gathering their early churches of converts, labored especially in great centres of population and influence, and were careful there to ordain 'elders' or 'bishops' (i.e., pastors). The natural inference that such pastors in such centres would be accepted as leaders by the surrounding and often daughter churches, and that their eminence would speedily lead to the conferring on them of functions essentially archiepiscopal and metropolitan, gives no basis for the supposition that the 'apostolic legates' Timothy and Titus were in any proper sense 'metropolitan archbishops,' with their suffragan bishops and provincial synods. (See Barrow, *Treatise on the Pope's Supremacy*, Suppos. v.) The jurisdiction of metropolitans, according to the ancient law of the church, was very considerable, and extended over all the bishops of that province of which the metropolitan see was capital. It was their privilege not only to summon and preside over provincial councils, to consecrate the provincial bishops, but also to decide certain causes, and in other ways to exercise authority within the sees of their suffragans. Recent canons have very much restricted their powers. The metropolitan is an archbishop, but distinguished from an ordinary archbishop by his having suffragan bishops subject to him, which is not necessarily the case of an archbishop.—In the Church of England, the Abps. of Canterbury and York are metropolitans, and in the Prot. Episc. Church of Ireland, those of Armagh and Dublin. In the newly constituted

METROPOLITAN MUSEUM.

hierarehy of the Rom. Cath. Church in England, the Abp. of Westminster has the rank of metropolitan. In the Rom. Cath. Church of Ireland, the Abps. of Armagh, Dublin, Cashel, and Tuam all possess the same rank. METROPOLITAN, a. having the rank of a metropolis, or pertaining to it; pertaining to the mother church. ME'TROPOLIT'ANATE, n. -līt'ā-nāt, the office or see of a metropolitan bishop. METROPOLITE, n. mē-trōp'ō-līt, archbishop; bishop of the mother church. MET'ROPOLIT'ICAL, a. -līt'ī-kāl, chief or principal as applied to cities; denoting archiepiscopal dignity or power.

METROP'OLIS LOCAL MANAGEMENT ACT: one of the special acts of the British parliament, regulating the metropolis of the United Kingdom for ædile and sanitary purposes; passed 1855. It created the Metropolitan Board of Works, with extensive powers of drainage, sewerage, lighting, cleaning, removing nuisances, and general improvements, and with powers also to rate the occupiers of houses for expenses of general management. Formerly, each vestry had done what it thought proper within its own parish.

METROPOLITAN MUSEUM OF ART: a museum in Central Park, New York, near Fifth Ave. and opposite 83d St. It is the outcome of a public meeting in the Academy of Music, 1869, when a committee was appointed to draft a plan for founding an institution for the culture of art. The state legislature granted this committee a charter 'for the purpose of establishing a museum and library of art; of encouraging and developing the study of the fine arts; of the application of art to manufactures and to practical life; of advancing the general knowledge of kindred subjects; and, to that end, of furnishing popular instruction and recreation.' The contribution of \$1,000 to the funds of the museum confers the title of patron; of \$500, that of fellow in perpetuity; and of \$200, that of fellow for life. Contributions of works of art or of books to the value of twice this amount may be accepted in lieu of money. The first important acquisition was what is known as the Blodgett collection of pictures, consisting chiefly of examples of Flemish and Dutch masters. An archæological collection, consisting of more than 30,000 objects, gathered by Gen. di Cesnola, U. S. consul to Cyprus, during his explorations among the ruins of that island, was next added. These collections were temporarily housed and exhibited until the legislature authorized the Park dept. to erect a permanent building, which was formally opened by the President of the United States 1880. Among the objects of interest are Egyptian antiquities and ancient sculpture; sarcophagi and mummies; terra-cottas, inscriptions, and bronzes; glass, laces, and ancient pottery; mediæval ivories and casts of sculpture. The collection of paintings is large and extremely valuable. Miss Catharine Lorillard Wolfe bequeathed paintings valued at over \$500,000. The *Friedland*, 1807, by Meissonier, representing Napoleonsaluting his troops as they go into battle, cost \$69,000, and Rosa Bonheur's *Horse Fair* cost \$55,500.

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Many masterpieces of the world are here preserved, among them the *Return of the Holy Family from Egypt*, by Rubens, and *Lions Chasing Deer*, by the same. Among recent contributions are a number of architectural models, the Parthenon, Notre Dame, etc., and several hundred mummy-wrappings of rare colors. The Di Cesnola collection comprises nearly 4,000 pieces of terra-cotta, consisting largely of vases; the glassware, about 1,700 pieces, is of both Phœnician and Greek workmanship; the gold and silver ornaments were found at Curium, besides many in Greek tombs. A notable feature of the museum is a memorial to Edgar Allan Poe, presented by the actors of New York. It consists of a statue of Poetry crowning with immortelles a bronze bust. The public are admitted to the museum free of charge during 4 days of the week—Wednesdays, Thursdays, Fridays, and Saturdays, also on holidays. On other days an admission fee of 25 cents is charged. Electric lights have been arranged so that the paintings, etc., can be viewed at night, and on Tuesday and Saturday evenings the building is open until 10 o'clock. Since 1891 the doors have been opened to the public on Sunday afternoons, also.

METSU, *mět'sü*, or **METZU**, *mět'zū*, **GABRIEL**: Dutch painter whose pictures are rare and valuable, and of whose life but little is known: b. Leyden (prob.) 1630; died after 1667. It is supposed that he was instructed by his father, who was an artist, and by Gerard Dow, and that about 1650 he removed to Amsterdam and became a pupil of Rembrandt. He attempted sacred subjects first, but later turned with great success to depicting scenes in the market and tavern, and the social life of the upper classes. Among the most famous of his pictures are the *Game-Dealer's Shop*, at Dresden; the *Ride of the Prince of Orange*, purchased by Baron Rothschild 1873 for £3,000; and the *Market-place of Amsterdam*, at the Louvre.

METTERNICH, *mět'tér-nĭch*, **CLEMENS WENZESLAUS NEPOMUK LOTHAR**, Prince von Metternich and Duke of Pontella: eminent Austrian diplomatist and statesman: 1773, May 15—1859, June 11; b. Coblenz; son of **FRANZ GEORG KARL**, Count von M., Austrian diplomatist, associate of Kaunitz. M. represented a very ancient and distinguished family, whose original seat was in Jülich. Young M. was educated at the Univ. of Strasburg, and afterward studied law at Mainz and travelled in England. In 1795 he married the grand-daughter and heiress of the celebrated minister Kaunitz, by whom he acquired large estates. His diplomatic career commenced at the congress of Rastadt, which he attended as representative of the Westphalian counts. His rise was very rapid; he added to the advantages of his birth and connections a more than ordinary diplomatic ability, with most graceful and winning manners. In 1801 he became Austrian ambassador at Dresden: and on the outbreak of the third coalition war, he negotiated the treaty of alliance between Austria, Prussia, and Russia. In 1806

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he went as ambassador to Paris, and concluded 1807 the treaty of Fontainebleau, very favorable to the interests of Austria; but on the outbreak of the war between France and Austria 1809, he was detained some time ere he could obtain his passport. In that year he succeeded Count von Stadion as minister of foreign affairs (beginning his course as first minister of Austria 1809-48), concluded the treaty of peace with the French minister Champagny, and accompanied Empress Maria Louisa to Paris. He guided the course of Austria amid the difficulties of 1812-3. He maintained at first a temporizing policy and a scheme of an armed mediation of Austria; but the obstinacy of Napoleon reduced him to the necessity of adopting at last a decided step, and led him to resolve on a declaration of war by Austria against France, 1813, Aug.; and he subsequently conducted with great ability the negotiations which ended in the completion of the quadruple alliance. On the eve of the battle of Leipzig, the emperor of Austria bestowed on him the princely dignity. He was afterward employed in almost all the chief diplomatic affairs of that eventful time; and after the congress of Chatillon and negotiations with the Count d'Artois, he went to Paris, and signed the convention of Fontainebleau with Napoleon, went to England to negotiate concerning a new quadruple alliance, and attended the congress of Vienna, of which he was unanimously elected president. He signed, as Austrian plenipotentiary, the second peace of Paris, 1815, Nov. 20. After this, he continued still to conduct the diplomacy of Austria, and 1821 was appointed chancellor (*Haus-, Hof- und Staatskanzler*), and 1826 succeeded Count Zichy in the presidency of ministerial conferences on home affairs. His efforts were now earnestly directed to the maintenance of peace in Europe, and preservation of the existing state of things in the Austrian dominions by the strictest measures of police and severe despotism. The revolutionary movement of 1848 breaking forth with sudden violence, caused the aged minister to flee from Austria, and to seek refuge in England; nor did he return to Vienna till the end of 1851, when he received great marks of honor and favor from the emperor; but though sometimes consulted, he was never again asked to undertake the cares of office. He died at Vienna. During 1815-48, he was the leader of European conservatism, in which he showed the blindness of infatuation, indulging in puerile denunciations of reformers and liberals, opposing constitutional government, and procuring the establishment throughout Germany of a system of repression with which he thought to stifle discontent, but which instead forced it into more insidious and more violent activity. It has been said of him that he was political diplomatist and manager rather than statesman. It is pleasant to record that in private he was lovable, affectionate in his family, delightful in his friendships. The general opinion respecting M. has been well expressed by the (*London*) *Times*

newspaper: 'He was renowned rather than great, clever rather than wise, venerated more for his age than his power, admired, but not lamented.' The *Memoirs* of M., largely autobiographical, throw valuable light on his times. They appeared, edited by his son, 1879-82.

METTLE, n. *mět'l* [a metaphor taken from the *metal* of a blade, upon the temper of which its power depends]: natural ardor; spirit; sprightliness; courage; warmth of temperament; in *OE.*, substance. METTLED, a. *mět'ld*, high-spirited; ardent; brisk; full of fire. METTLESOME, a. *mět'l-süm*, high-spirited; brisk; full of mettle.

METTRAY, *mět-trā'* or *mā-trā'*, THE REFORMATORY OF: parent of all institutions intended to reform and restore to society, and not merely to punish, juvenile delinquents. Demetz, of the Parisian bar, struck with the evils and hardship attending the committal to prison of young, and, considering their training and habits, scarcely responsible criminals, there to languish hopelessly for a time, and then to emerge worse than when they entered, resolved, in conjunction with the Vicomte Breignères de Courteilles, to found a school for reformation of this class of offenders. In 1839, accordingly, the Reformatory, or, as it is called, the *Colony of M.*, was established, about five m. from the city of Tours in France; and its operation gave proof that, by agricultural and other industry, and well-considered rules of organization and discipline, the neglected criminal may be trained to take his place honestly in society. The children, wholly orphans, foundlings, and delinquents, in 1872 numbered 792. From the foundation till that date, 4,287 had been received. The relapses into crime of those who had left the colony amounted to only about 4 per cent. The success is due not solely to the excellent training and close supervision at M. itself, but to the care taken to preserve the link between the authorities and those who have left the colony. A small payment is made by the state for children sent under judicial sentence; the large extra expenditure necessarily incurred being defrayed from charitable contributions from individuals constituting the 'Paternal Society of Mettray.'

METZ, *měts*, F. *mās*: strongest fortress of the German imperial territory of Alsace-Lorraine, cap. of the dist. of Lorraine; before 1871, the main bulwark of France on her n.e. frontier, and cap. of the dept. of Moselle. It is on the Moselle, at its confluence with the Seille. The strength of M. consists in its exterior defenses, of which the principal are 11 forts, partly strengthened and improved since the German occupation, partly entirely new. The city contains many important institutions, barracks, hospital, military schools, and arsenals. The cathedral, Gothic, begun 1014, finished 1546, is remarkable for boldness, lightness, and elegance, and has a beautiful spire of open-work, 373 ft. in height. The industry is active;

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there is trade in wine, brandy, indigo, glass; and there are several cloth manufactories in the neighborhood.

M., known to the Romans as *Divodurum*, was afterward called Mettis (corrupted from *Mediomatrici*, name of the people); hence the present form. Under the Franks, M. was cap. of Austrasia (q.v.). At the division of Charlemagne's empire, M., with the rest of Lorraine (q.v.), fell to Germany, and was afterward made a free city of the Empire. In 1552 it was treacherously taken by the French; and though Charles V. besieged the place from 1552, Oct.—1553, Jan., they kept it till it was formally ceded to them 1648. 1870, Aug., Bazaine was compelled to retire before the German army into M., with his forces; and after an investment of 70 days, during which no attempt was made to take the city by force (not even a single shell having been fired into it), Europe and the world heard the startling news of the capitulation of M., by which 180,000 men and immense military stores fell into German hands 1870, Oct. 27. By the treaty of Frankfurt, M. was annexed to Germany as part of Lorraine. Pop. (1869) 48,325; (1875) decreased by emigration into France, 37,925; or with garrison 45,856; (1881) 43,275; (1890) with garrison 59,723. Of the total civil pop. about half are Germans; of the total civil and milit. 17,000 are Protestants, 1,600 Jews; (1900) 55,462.

MEUDON, *mêh-dōng'*: town of France, dept. of Seine-et-Oise, 5 m. w. of Paris, on the Versailles and Paris railway. The *château*, approached by a fine avenue of four rows of lime-trees, was built by the side of an older *château*, the work of Philibert Delorme, by the Grand Dauphin, son of Louis XIV., 1699. During the Revolution, it was converted into a factory for warlike engines, and surrounded with a permanent camp, to keep out spies. The *château*, as it exists at present, was fitted up for Marie Louise by Napoleon 1812. It has a fine terrace, gardens beautifully laid out, and commands a very fine prospect. The Forêt de Meudon is a favorite holiday resort of the Parisians. Near it has been erected an expiatory chapel, dedicated to Notre Dame des Flammes, marking the scene of a terrible railway accident 1842, May, in which more than 100 persons were burned alive. Whiting is manufactured, and there are numerous bleach-fields. Rabelais was curé of M. for a long time. The *château* was for many years a favorite summer residence of Prince Napoleon.—Pop. (1886) 7,570; (1891) 8,005.

MEULEBEKE, *mö'leh-bā-kéh*: town of Belgium, province of W. Flanders, 20 m. s.w. of Ghent, on the Mandel, a tributary of the Lys. Weaving is carried on, and there are several breweries. It is near a railway, which connects it with Bruges and other places. Pop. 8,300.

MEUM and TUUM, *mē'ūm*, *tū'ūm* [L. *meum*, my or mine; *tuum*, thy or thine]: what is mine, and what is another's. *Note*.—Not knowing the difference between *meum* and *tuum* is politely saying the individual is a thief.

MEUNG—MEUSE.

MEUNG, *mŭng* (or **MEHUN**, *mā-ŭng'*), **JEAN DE**: about 1279–1320; b. Meun, France: poet. He gained wide reputation by his scholarship; lived many years at the court of Philippe le Bel; and though author of many poems and sarcastic works, is best known by his attempt to complete the *Roman de la Rose*, left unfinished by Guillaume de Lorris. He wrote more than one-half of the work as it now exists.

MEURSIUS, *mē-ēr'si-ŭs*, **JOHANNES**: 1579–1639, Sep. 20; b. Loosduinen, Holland: historian. He received a univ. education; became an accomplished philologist by study and travel; held the chairs of history (1610) and Greek in Leyden Univ.; and, leaving Holland on account of political disturbances, accepted a chair in the Acad. of Sorøe, Denmark, where he died. He was esteemed one of the most learned men of his time; and besides many critical monographs on Greek and Roman literature, was author of a history of Denmark in Latin, and of *Glossarium Græco-barbarum* (1614) and *Athenæ Batavæ* (1625).

MEURTHE, *mért*: formerly a dept. in n.e. France, immediately s. of the former dept. of Moselle. The area was about 2,254 sq. m.; pop. (1866) 428,387. Its surface is undulating and picturesque; while along the e. border are the Vosges Mountains, rising in one point to 1,148 ft. The chief rivers are the Moselle and its affluents, the Meurthe, the Madon, the Seille, etc. This dist. is remarkable for beauty of scenery, fertility of soil, and variety of productions. After the treaty of Frankfurt, by which part of M. was ceded to Germany, the rest of M., with the small part of the dept. of Moselle that remained to France, was formed into a new dept. under the name **MEURTHE-ET-MOSELLE**; 2,015 sq.m.; pop. (1901) 484,722. Arrondissements: Nancy, Lunéville, Toul (from M.), and Briey (from Moselle); cap. Nancy.

MEUSE, *méz*: river in n. Europe, rising in the dept. of Haute-Marne, France, and flowing n. through the depts. of Vosges, Meuse, and Ardennes. It traverses the mountainous 'forest of Ardennes,' and enters Belgium at Namur, where it is joined by the Sambre from the w.; thence running n.e. past Liége, it receives the Ouerthe; forms part of the boundary between Belgium and Holland; passes Maestricht and Roermund, and is joined by the Roer. Below Gorkum it separates into two branches, each of which afterward also divides into two, the whole finally discharging through these channels into the North sea. Their delta, forming shoals and quicksands, is larger than that of any other river in Europe. It passes, besides the cities mentioned, Verdun, Sedan, Mézières, and Charlemont, in France; and Venloo, Dort, and Rotterdam, in Holland. It is about 580 m. long, and navigable about 45 m. from its mouth.

MEUSE, *méz*: frontier dept. in n.e. France: 2,400 sq. m.; pop. (1901) 283,480. The surface is traversed s.e. to n. w. by two parallel ranges of hills, which from the

right and left bank of the river Meuse (see MAAS), and separate it from the basin of the Seine on the w., and from that of the Moselle on the e. The Meuse, the Ornain, and the Aire are the chief rivers. The soil is generally poor, except in the valleys of the principal rivers, which are remarkably fertile and well cultivated. The usual crops are raised. 22,000,000 gallons of wine (red and white) are made annually. The four arrondissements are Bar-le-Duc, Commercy, Montmédy, and Verdun; cap. Bar-le-Duc.

MEUSE, a. *mūz*, as in *Meuse Lane*: a Scotch spelling of MEWS, which see under MEW 2.

MEW, v. *mū* [F. *miauler*; Ger. *miauen*, to cry as a cat: an imitative word]: to cry as a cat: N. the cry of a cat. MEW'ING, imp. MEWED, pp. *mūd*. MEWL, v. *mūl*, to cry as a child from uneasiness; to squall. MEWL'ING, imp.: ADJ. crying or screaming as a child. MEWLED, pp. *mūld*. MEWL'ER, n. *-ér*, one that mewls.

MEW, v. *mū* [F. *muer*, to moult, to mew—from L. *mutārē*, to alter, to change: Low Ger. *muten*, to moult: Norw. *muta*, to lurk or seek covert as a bird moulting (see MOULT)]: to shut up; to confine; to inclose; to shed the feathers; to moult: N. a cage for hawks; in *OE.*, an inclosure; any place of confinement. MEW'ING, imp.: N. act of moulting. MEWED, pp. *mūd*. MEWS, n. plu. *mūz*, the royal stables in London, so called from having been the place where the hawks were kept; any range of buildings occupied as stables.

MEW, n. *mū*, or SEA-MEW [AS. *mæw*; Dut. *meeuw*, a gull or sea-swallow: an imitative word]: English term for the common European Gull (q.v.) and various small gulls.

MEXICAL, a. *měks'ī-kāl* [from *Mexico*]: denoting an ardent spirit or brandy distilled from agave-wine.

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MEXICO, *měks'î-kō*, Sp. *mā'chē-kō* : republic, occupying the s.w. extremity of N. America, with a portion of the isthmus which connects N. and S. America. It is bounded n. by the United States, w. by the Pacific Ocean, s. by the Pacific and Central America, e. by the Gulf of Mexico; area about 750,000 sq. m. Pop. (1881) about 10,000,000; in this total there were: full-blooded Indians, 5,000,000; Mestizos (half-castes), 3,000,000; Creole whites, 1,500,000; Spaniards, 50,000; other Europeans and Americans, 100,000; negroes, 10,000; besides mulattoes. Pop., census of 1900, 13,545,462.

States.	Sq. M.	Pop. 1900.	Capitals.	Pop. 1900.
Aguas Calientes..	2,895	101,910	Aguas Calientes...	35,042
Campeachy.....	25,832	84,281	Campeachy.....	
Chiapas.....	16,048	363,607	San Cristobal.....	
Chihuahua.....	79,021	327,004	Chihuahua.....	
Coahuila.....	50,890	280,899	Saltillo.....	23,996
Colima.....	3,743	65,026	Colima.....	
Durango.....	42,510	371,274	Durango.....	31,092
Guanajuato.....	11,411	1,065,317	Guanajuato.....	41,486
Guerrero.....	24,550	474,594	Chilpancingo.....	
Hidalgo.....	8,163	603,074	Pachuca.....	37,487
Jalisco.....	39,168	1,137,311	Guadalajara.....	101,208
Mexico.....	7,838	924,457	Toluca.....	25,904
Michoacan.....	25,689	935,849	Morelia.....	37,278
Morelos.....	1,776	161,697	Cuernavaca.....	
Nueva Leon.....	23,635	326,940	Monterey.....	62,226
Oajaca.....	33,591	947,910	Oajaca.....	35,049
Puebla.....	12,021	1,024,446	Puebla.....	93,521
Queretaro.....	3,207	228,489	Queretaro.....	33,152
San Luis Potosi...	27,500	582,486	San Luis Potosi...	61,019
Sinaloa.....	36,198	296,109	Culiacan.....	
Sonora.....	79,021	220,553	Hermosillo.....	
Tabasco.....	11,851	158,107	San Juan Bautista.	
Tamaulipas.....	20,225	218,948	Ciudad Victoria...	
Tlaxcala.....	1,620	172,217	Tlaxcala.....	
Vera Cruz.....	26,232	960,570	Jalapa.....	
Yucatan.....	29,567	312,264	Merida.....	34,630
Zacatecas.....	22,998	462,886	Zacatecas.....	32,856
Federal Dist....	461	540,478	Mexico.....	344,721
Cal., Lower....	61,562	47,082	La Paz.....	
Terr. of Tepic...	11,580	149,677	Tepic.....	

Physical Character, etc.—The great mass of the Mexican territory consists of an elevated plateau, formed by an expansion of the Cordilleras (q.v.) of Central America, from which terraced slopes descend with more or less rapid inclination toward the Gulf of M. on the e., and the Pacific on the w. This vast tract, 18°—32° n. lat., and 95°—115° w. long., comprises one of the richest and most varied zones in the world; for while its geographical position secures to it a tropical vegetation, the rapid differences of elevation afford it the advantages of temperate climates, in which all varieties of European flora and fauna can come to perfection; and it thus combines within its limits an almost unparalleled exuberance and multiplicity of natural products. The table-lands of M. are at elevations 5,000 to more than 9,000 ft. above sea-level, and exhibit great differences of level and varieties

of soil. They generally incline northward and are girt in by low mountain chains, among which rise individual lofty peaks—e.g., Cofre de Perote (13,400 ft.), Orizava (17,370 ft.); while they are intersected by higher ranges, above which tower a few cones—e.g., Istaecihuatl, the White Woman (15,700 ft.), and the volcano of Popocatepetl, or the Smoking Mountain (17,880 ft.). These volcanoes and several others of less note, within the parallels $18^{\circ} 15'$ and $19^{\circ} 30'$ n. lat., form a transverse volcanic band between the two oceans, and do not follow the inclination of the central chain, as is the case in the volcanoes of S. America. Volcanoes occur also isolated—e.g., in the plain of Mixtecapan, 2,900 ft. above the sea, where, 1759, the volcano Jorullo, which still emits smoke, was formed after an eruption by which a surface of many sq. m. was raised several ft. above the level of the plain; in fact, every part of the Mexican territory betrays the volcanic nature of its formation, though neither earthquakes nor any other active phenomena have of late been frequent. The principal chain intersecting the tableland is the Sierra Madre, or Tepe Suene, in which lie the chief gold and silver mines, and which, after traversing the states of Queretaro and Guanajuato, divides into three main branches, the central of which forms the water-shed between the Pacific Ocean and the Gulf of M. In addition to these great chains, the Mexican territory is intersected by numerous minor ranges, which on the Pacific side break up the terraced declivities into innumerable deeply-cleft valleys, which assume almost the character of steep ravines near their junction with the narrow littoral plains of the Pacific Ocean. Violent storms rage on this coast, blowing from the s.w. during the hot months, when the climate is as unhealthful to whites as on the Mexican Gulf, though it is not visited by the yellow fever. M. may be said to be generally deficient in navigable rivers; for though some of the largest have a course of more than 1,000 m., few are free from rapids. The Rio Santiago, or Rio Grande, with a course of 500 m., is broken near Guadalajara by 60 falls in less than three m.; the Rio Grande del Norte, which forms in its lower courses the boundary between M. and the United States, has a winding course of nearly 1,800 m., but is navigable only for small sailing-vessels to Matamoros, 60 m. from its mouth, where a bar and numerous shoals obstruct the passage. A similar remark applies to the majority of the rivers which fall into the Gulf of M. The e. coast generally presents great obstacles to navigation, as it is low and sandy, unbroken by bays or inlets, and lined by sand-banks several miles in width; the only points of access being the mouths of rivers, which are not good roadsteads, as, with few exceptions, the rivers have little water, except at the rainy season, which generally sets in about June, accompanied by overpowering heat, during the prevalence of which the yellow fever, or *vomito prieto*, rages like a pest in all these low lands. M. is on the whole poorly sup-

plied with water; and since the Spaniards have discontinued the system of irrigation followed by the Aztec races with great success, many tracts have become barren, and unsuited for human occupation. A great portion of the table-lands can be used only for pasture. Springs are rare, and many of the rivers flow in deep mountain-beds, without receiving smaller tributaries, while the rapid evaporation on a light soil, covering porous rocks, leaves the surface dry and hot, and unable to support vegetation other than the cactus and some low grasses. The plains, moreover, contain the beds of numerous dry salt lakes, but this is chiefly on the n. and e. of the table-land. The w. parts of the plateaux 100° — 102° w. long. (known as the Baxio) yield, by careful irrigation, rich crops of maize and wheat, and rank among the most fertile agricultural districts of M. They are, however, here and there interrupted by sterile tracts, either covered by stones, and then known as 'pedegral,' or with lava, when they are characterized as a *mal pais* (bad country). In contrast with these unprofitable districts, the plains are occasionally broken by depressions of the soil, known as *Barrancas*, descending sometimes 1,000 ft., and measuring several miles across, covered with a luxuriant vegetation of trees and shrubs, and watered by small streams running through the middle of the valley. M. has numerous lakes, but few of importance; that of Chapala in Jalisco is one of the most considerable, being more than 90 m. long.

Climate, Products.—The differences of climate, depending on the different degrees of altitude, are so great in M., that the vegetable products of this vast country include almost all that are found between the equator and the polar circle. In a few hours, the traveller may experience every gradation of climate, embracing torrid heat and glacial cold, and pass through different zones of vegetation, including wheat and the sugar-cane, the ash and the palm, apples, olives, and guavas. The Spaniards, on their first occupation of M., distinguished its great climatic divisions under the characteristic names, which are still retained, of the *Tierras Calientes* (hot or littoral lands), *Tierras Templadas* (temperate lands), and *Tierras Frias* (cold or high lands). The mean annual heat of the *Tierras Calientes* is 77° ; and the soil, generally fertile, produces maize, rice where water can be procured for irrigation, bananas, pine-apples, oranges, manioc; and sarsaparilla, jalap, and vanilla in the littoral swampy forests. This tract has only two seasons—the winter, or season of n. winds, and the summer, or season of breezes. In the winter, hurricanes are the terror of navigators, but the coast is clear of yellow fever, which prevails in the hot season. On the medium elevations of the *Tierras Templadas*, the temperature is extremely equable, varying only from about 70° to 80° F.; the climate healthful, and wherever water is abundant, a perpetual summer reigns, yielding a varied and active vegetation, which embraces all the cereals, fruits, and

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vegetables of central and s. Europe, among which maize, oranges, lemons, grapes, and olives are in exuberant abundance. The Tierras Frias, which would scarcely have been characterized as cold by discoverers belonging to a less southern climate than Spain, possess a generally temperate climate, the mean annual heat ranging between 66° and 68° F.; but on the highest of the table-lands the air is keener, and the soil more arid, and agriculture is limited to the cultivation of barley and of the agave, or Mexican aloe, which held the place of the vine among the ancient Aztecs, and is still extensively cultivated for its juice, which is made into the fermented drink known under the name of *pulque*. In addition to the vegetable products above referred to, M. yields coffee, tobacco—whose growth is, however, limited by governmental restrictions—yams, capsicums, pepper, pimento, indigo, ipecacuanha, dragon's-blood, copaiva, fan-palms, india-rubber trees, mahogany, rosewood, ebony, etc.

The products of the mines, which rank among the richest in the world, include the precious metals. The gold mines of M. occur principally on the w. side of the Sierra Madre, n. of 24° n. lat., and, until the discovery of the metal in Australia, their yield surpassed the product of any other part of the world. Silver mines abound in M., and the argentiferous veins, which may be said to intersect every part of the w. declivities of the Cordilleras, occur in some places—e.g., in the *Vela Madre* lode at Guanajuato—in beds 10 to 50 yards in depth; the precious metal being in these cases intermixed with sulphur compounds, antimony, and arsenic. But though these mines possess the additional special advantage of being in fertile districts, affording abundant food to miners and their cattle, their working has been very imperfect, owing to the unsettled state of the country. At the close of the 18th, and the beginning of the 19th c., the annual value of the gold and silver of M. was more than \$30,000,000, of which $\frac{9}{10}$ were yielded by the silver; but the political disturbances, preceding and consequent on the wars of independence, have very considerably reduced this sum, which has probably never been reached since M. was finally separated from Spain. In addition to gold and silver, M. yields tin, antimony, mercury, copper, lead, iron, and zinc; while carbonate of soda, used in smelting silver, is found crystallized on the surface of several lakes, and occurs, with common salt, in dry seasons, on the more arid parts of the surface of the elevated table-lands.

Cattle, horses, asses, mules, and sheep abound in M. where, in consequence of the extent and excellence of the pasture-grounds, all the domestic animals introduced from the old world have multiplied excessively. Buffaloes feed in the lower plains; goats and sheep are plentiful; the tapir, wolf, American lynx, jaguar, wild-cat, several species of the skunk, the brown porcupine, stag, deer, etc., are found. Parrots, humming-birds, and wild game birds, including turkeys, are abundant; and al-

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most all the lakes yield fish in abundance. The cochineal insect and the silk-worm are reared with great success on the table-land of Mixtecapan.

Commerce, etc.—Notwithstanding the enormous advantages presented by the natural productions of M. and its important geographical position between the Atlantic and the Pacific, M., owing to unsettled government, and consequent insecurity of life and property, was long prevented from an extensive development of foreign commerce. The precious metals still constitute nearly two-thirds of the exports, the remainder being productions of the soil, and industrial products, such as cotton, woolen, and silk goods, soap, leather, saddlery, gold and silver lace, cigars, brandy, etc. Foreign commerce is maintained principally with England, France, Hamburg, and Lübeck, and the United States. The city of M. is the chief focus of internal trade, and Vera Cruz the principal port for maritime commerce. The total value of the foreign trade of M. 1894 was: imports \$34,000,000, exports \$90,855,000; the exports include precious metals \$52,535,854, merchandise \$38,319,099. In 1893-94 more than 1200 vessels of over 1,000,000 tons in the foreign trade, and more than 7,700 of over 1,500,000 tons entered and cleared the ports of M. M. had (1895) 6,322 m. of railway, the line from Vera Cruz to Mexico being one of the most wonderful pieces of engineering enterprise in the world. The traffic amounted (1892) to about 21,700,000 passengers and 3,100,000 tons of freight. After the establishment of independence, the finances were allowed to fall into disorder, so that the expenditure continually increased beyond the receipts. In recent years the improvement has been great and gratifying. One-half of revenue is derived from the customs. The total amount of the national debt was estimated (1881) \$137,750,000; (1889) foreign \$75,000,000, domestic \$16,000,000; total \$91,000,000. In 4 years the foreign debt was reduced by \$88,000,000, and a large amount of floating debt was paid beside. In 1894, June 30, at the then current rate of exchange, the total debt stood at £29,610,669, or about \$148,000,000. (The loans contracted by the imperial govt. were repudiated by the republican govt.)

Army, Navy, etc.—In accordance with the old constitution of M., the standing army was to consist of 26,000 men, with a reserve of 65,000 men; but this number, which had fallen to nearly half the required force 1855, has been so extensively reduced since that period, by continual civil wars, that, according to Spanish authorities, the govt. of the late Pres. Juarez, on the breaking out of hostilities with the French 1862, was unable to bring into the field more than 5,000 infantry, 800 cavalry, and 9,500 of the national guard. The strength of the permanent army (1895) is 2,270 officers and 34,900 men; war strength including reserves 132,000 infantry, 25,000 cavalry, and 8,000 artillery; total 165,000. The fleet consists of 2 despatch-vessels, 2 unarmored gun-boats, and 1 steel training-ship of 1,200 tons; 5 torpedo-boats have been ordered in England (1897).

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Education.—In almost all the states, education is nominally free and compulsory, yet in the municipality of Mexico in 1890 there were 15,268 persons who could read only, and 176,692 who could neither read nor write. In 1893 there were in the republic 217 secondary and professional schools, and 1 military and naval college.

Religion, etc.—The Rom. Cath. is the dominant church of M., but all other sects are tolerated. M. has 3 archbishops and 12 bishops. The administration of justice is not what it should be, but is not so inefficient, nor the courts so corrupt, as formerly. Brigandage and smuggling endanger personal security, and seriously damage the resources of the nation, but are gradually diminishing.

The supreme power of the state was, 1858, vested in the hands of Benito Juarez, who was to bear the title Constitutional President, and administer public affairs in conjunction with a legislative congress, composed of a chamber of senators and a lower house of representatives. Each province was to elect two senators and one deputy to every 40,000 inhabitants, and was, moreover, to have a separate provincial legislative chamber, presided over by its governor. Pres. Juarez is undoubtedly, with Gen. Iturbide, to be regarded as the most distinguished character in modern Mexico. The unfortunate Maximilian was a mere episode in the career of the country. A Provisional Regency of the Mexican Empire was appointed by the *Junta Superior del Gobierno*; which was itself constituted 1863, June 16, by a decree of Marshal Forey, leader of the French army of invasion. It was composed of 35 members. This Junta at the same time established, under French influence, an *Assembly of Notables*, whom it charged with deciding in the name of the people what form of govt. M. should adopt. 1863, July 10, this body, by an overwhelming majority, decided in favor of a constitutional hereditary monarchy, and that the new ruler should bear the title Emperor of Mexico. The present constitution dates from 1857. The executive power is vested in a president, elected by universal suffrage for a period of 4 years. The legislative power is vested in a congress consisting of a house of representatives (one for each 80,000 inhabitants) and a senate (with two members for each state).

History of Mexico.—The history of ancient M. exhibits two distinct and widely-differing periods, the former of which, that of the Toltecs, appears to have begun in the 7th, and ended with the 12th c.; while the second, that of the Aztecs, began 1200, and may be said to have been closed by the conquest of Cortes 1519; for though the race has maintained occupation of the Mexican territory, its existence as a nation ceased with the Spanish domination. The origin and primitive seats of the Toltecs are shrouded in mystery; and all that we learn of this people is, that they came from the n., from some undefined locality, which they designated Tullan, and whence

they brought to the valley of M. the first elements of civilization. Their laws and usages stamp them as a people of mild and peaceful instincts, industrious, active, and enterprising. They cultivated the land, introduced maize and cotton, made roads, erected monuments of colossal dimensions, and built temples and cities, whose stupendous ruins in various parts of New Spain still attest their skill in architecture, and explain why the name Toltec should have passed into a synonym for architect. When Cortes conquered M., 1519, many of these vast ruins seemed as ancient as now—their gigantic masses even then overgrown with forest trees. See CHOLULA: PALENQUE. The Toltecs knew how to fuse metals, cut and polish the hardest stones, fabricate earthenware, and weave various fabrics: they employed Hieroglyphics (q.v.), for record of events, were acquainted with the causes of eclipses, constructed sun-dials, devised a simple system of notation, and measured time by a solar year, composed of 18 months of 20 days each, adding 5 complementary days to make up the 365, and intercalating $12\frac{1}{2}$ days at the expiration of every 52 years, which brought them within an almost inappreciable fraction to the length of the tropical year, as established by the most accurate observations. These and other arts, with a mild form of religion, and a simple but just mode of administering the laws, the Toltecs bequeathed to the Aztecs, who engrafted upon the civilization of their predecessors many fierce and sanguinary practices in their religious, and many puerile usages in their social, life. Nothing is known of the exact time, and still less of the manner and causes, of the departure of the Toltecs from M.; but it has been conjectured that they went toward the south, and that the colossal architectural remains of the cities of Palenque, Uxmal, and Mitla, in Central America, are the work of their hands. The Aztecs, as we have said, imparted to the institutions of the Toltecs a tinge of their own sombre cruelty, and produced an anomalous form of civilization, which astonished the Spaniards by its mingled mildness and ferocity. Like the Toltecs and the Chichmecs, a rude tribe who had succeeded them, the Aztecs came from the n., and after wandering from place to place, founded 1325 the city of Tenochtitlan, or Mexico. On the arrival of the Spaniards, their empire was found to extend from ocean to ocean, stretching on the Atlantic from 18° to 21° n. lat., and on the Pacific from 14° to 19° n. lat. Their government was an elective empire, the sovereign being selected from the brothers of the deceased prince, or, in default of them, from his nephews. Their laws were severe, but justice was administered in open courts, the proceedings of which were perpetuated by picture-written records.

The Aztecs believed in one supreme invisible creator of all things, the ruler of the universe, named Taotl—a belief, it is conjectured, not native to them, but derived from their predecessors, the Toltecs. Under this su-

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preme being stood 13 chief and 200 inferior divinities, each of whom had his saered day and festival. At their head was the patron god of the Aztecs, the frightful Huitzilopochtli, the Mexican *Mars*. His temples were the most splendid and imposing; in every city of the empire his altars were drenched with the blood of human saerifice. Cortes and his companions (see DIAZ) were permitted by Montezuma to enter that in the city of Mexico, and to behold the god himself. 'He had a broad face, wide mouth, and terrible eyes. He was covered with gold, pearls, and preeious stones; and was girt about with golden serpents. . . . On his neck, a fitting ornament, were the faeces of men wrought in silver, and their hearts in gold. Close by were braziers with incense, and on the braziers three real hearts of men who had that day been sacrificed' (Helps's *Spanish Conquest in America*, II., book x., chap. 4). The smell of the place, we are told, was like that of a slaughter-house. To supply victims for these saerifices, the emperors made war on all the neighboring and subsidiary states, or in case of revolt in any city of their dominions, and levied a certain number of men, women, and children by way of indemnity. The victims were borne in triumphal processions, and to the sound of music, to the summit of the great temples, where the priests, in sight of assembled crowds, bound them to the sacrificial stone, and opening the breast, tore from it the bleeding heart, which was either laid before the image of their gods, or eaten by the worshippers, after having been carefully cut up and mixed with maize. In the years immediately preeeding the Spanish conquest, not less than 20,000 victims were annually immolated. These atrocities were incongruously blended with milder forms of worship, in which fruits, flowers, and perfumes were offered up amid joyous outbursts of song and dance. According to their mythology, Taotl, who delighted in these purer saerifices, had once reigned in Anahuac (a name which at first probably applied only to the country in the immediate vicinity of the capital, though afterward it was applied to the whole Aztec empire), in the golden age of the world, but being obliged, from some unexplained cause, to retire from earth, he departed by way of the Mexican Gulf, promising to return. This tradition accelerated the success of the Spaniards, whose light skins and long dark hair and beards were regarded as evidences of their affinity with the long-looked-for divinity. The Mexican priesthood formed a rich and powerful order of the state, and were so numerous that Cortes found as many as 5,000 attached to the great temple of Mexico. The education of the young of both sexes remained till the age of puberty in the hands of the priests and priestesses; and the sacerdotal class were thus able to exercise a widely-diffused influence, which, under the later rulers, was almost equal to that of the emperor himself. The women shared in all the occupations of the men, and were taught, like them, the

arts of reading, writing, ciphering, singing in chorus, dancing, etc., and even initiated in the secrets of astronomy and astrology.

On the arrival of Cortes, 1519, the Aztec throne was occupied by Montezuma, an energetic prince, who, after his election to the throne, which for several generations had been occupied by his ancestors, made successful war on the powerful and highly civilized neighboring state of Tlascala, and on Nicaragua and Honduras; after a time, however, he grew indolent, and alienated the affections of his subjects by his arrogance and exactions, and by his unremitting devotion to the services of the temples. According to the oracles which he frequently consulted, great changes were impending over the empire, the return of Quetzalcoatl was near at hand, and the fall of his race was impending. The tidings of the arrival on the coast of the expedition of Grigalva, 1518, terrified Montezuma and his priestly councillors; and when the hieroglyphic reports of his provincial officers announced the landing in the following year of Cortes and his companions, he endeavored to propitiate the dreaded strangers by sending an embassy charged with valuable gifts to meet them. The road to success was thus open to the Spanish captain, who, with a handful of men, advanced from San Juan de Ulloa to M., and gradually subdued the entire empire of the Aztecs, whose power crumbled to dust before the greater energy and superior civilization of their Christian invaders. In 1540 M. was united with other American territories under the name of New Spain, and governed by viceroys appointed by the mother country. The intolerant spirit of the Rom. Cath. clergy led to the suppression of almost every trace of the ancient Aztec nationality and civilization, while the strict system of sequestration enforced in M. crippled the resources of the colony; yet notwithstanding these drawbacks, M. ranked first among all the Spanish colonies in population, material riches, and natural products. It may be said to have vegetated for nearly three centuries in semi-quiet prosperity, interrupted by few disturbances of any kind until 1810, when the discontent, which had been gaining ground against the viceregal power during the war of Spain with Napoleon, broke into open rebellion under the leadership of a country priest named Hidalgo. Hidalgo's defeat, and death by execution 1811, put a partial stop to the insurrection; but the atrocities committed under the sanction of the new viceroy, Calleja, exasperated the people, and gave irresistible impulse to the revolutionary cause. Guerrero and Iturbide in turn gained signal advantages over the Spaniards. For a time, Iturbide maintained a self-established imperial rule over the colony; but on the downfall consequent on his tyrannical abuse of power, a constitutional mode of govt. was inaugurated, and 1824 the independence of M., which had then chosen a federal republican form of govt., was finally established, and in the follow-

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ing year definitely recognized by every foreign power, except Spain. The Mexican war was stained with excesses and atrocities on both sides; but the Spaniards gained unenviable pre-eminence by the wanton cruelty which characterized their conduct of hostilities. With them the war was one of extermination, every commander being allowed, at his own discretion, to hunt down and slaughter the insurgents like brutes. The welfare of the new republic was unhappily disturbed by constant outbreaks of civil war under the leadership of the Escozzes, or aristocratic faction, and the Yorkinos, or democrats; and the history of a quarter of a century, during which M. has exercised independent power, leaves little to recount beyond ever-recurring acts of violence, and the rapid and summary deposition of one president after another. In 1836 Texas secured its independence of the Mexican republic, for which it had struggled for several years; and at the same period differences arose with France, which were, however, brought to a peaceful conclusion after the taking of Vera Cruz 1838 by the French troops. In 1841 Gen. Santa Anna, on the retirement of Bustamante, succeeded in regaining the direction of affairs, from which he had been more than once deposed, and under the title Dictator exercised the power of an autocrat. In 1845 M. was compelled to recognize the independence of Texas, which was incorporated with the United States, whose troops having entered the Mexican territory, provoked a declaration of war by the Mexican government. Hostilities were carried on with great energy by both parties until 1848, when peace was concluded, after several bloody engagements, and after the city of Mexico had been stormed and taken by the Americans under Gen. Scott. In 1852, after Santa Anna and Herrera had been in turn deposed and recalled to power, a revolutionary movement of more than ordinary importance brought Gen. Cevallos for a time to the head of affairs; but when the insubordination and arrogance of the soldiery threatened universal anarchy, Santa Anna was again recalled, 1853, Mar. 17. Having reorganized the army, and suppressed by the most cruel severity the insurrection of the federals, he declared himself pres. for life, and thus again rekindled civil war. In 1855 he had to flee from the country. Until 1867, confusion prevailed. Santa Anna was succeeded by Gen. Alvarez, who held office about two months, after whom came Gen. Comonfort, who was forced to resign 1858; when a Gen. Zulvago assumed supreme power, but was almost immediately deposed by a Gen. Robles. This person also proving a futility, Benito Juarez (q.v.) was elected; but his claims were contested by Gen. Miramon—head of the priestly and conservative party—and the country was again plunged into civil war. The acts of wanton aggression and flagrant injustice perpetrated on foreigners in M. during this period of internal disorder, during which the Cortes passed an act suspending all payments to foreigners for two years, could not fail

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to draw upon the Mexican govt. the serious remonstrance of those European powers whose subjects had just cause of complaint, and the result was to bring a fleet of English, French, and Spanish ships into the Mexican Gulf to enforce satisfaction. 1861, Dec., the British minister left M., and the Spaniards disembarked a force at Vera Cruz, and took possession of the fort of San Juan d'Ulloa, a step which was soon followed by the arrival before the former city of the allied fleet. A proclamation signed by the commanders-in-chief of the three naval divisions, and addressed by them to the Mexican people, elicited no satisfactory reply; and steps were accordingly taken to advance at once upon the capital. This measure alarmed the provisional govt. of M., and brought about an armistice, with a view of negotiating a treaty for future regulation of commercial intercourse between M. and the great European powers. This treaty was drawn up and provisionally ratified by the different commanders, but not confirmed on the part of France, and consequently the French troops retained occupation of the Mexican territory after the English and Spaniards had declined to join in further hostile demonstrations. 1862, Apr., the French emperor formally declared war against the govt. of Juarez, who had assumed arbitrary rule as pres. of the republic.

After the declaration of war by the French, they issued a proclamation to the Mexican people, 1862, April 16, setting forth that one of the objects of the contest was to rescue them from the tyranny of their president, and put the govt. of the country on a stable footing. Little faith, however, seems to have been put in these professions; and the invaders, though joined by Marquez, military leader of the clerical party, met little success till the arrival of Gen. Forey in Sep., with a reinforcement from France. Forey then took the command-in-chief, addressed a proclamation to the Mexicans, promising them perfect liberty in the choice of a new govt. in place of that of Juarez; and in the spring of 1863, concentrated the French troops, and marched on the city of Mexico. On his way, he took the strongly fortified city of Puebla after a two months' siege, capturing its defender, Ortega, and his whole force (May 18); and, Juarez having fled from the capital, and transferred the seat of his govt. to San Luis Potosi at their approach, the French entered Mexico June 10. A fortnight afterward, a provisional govt., headed by Gen. Almonte, was established, and an 'Assembly of Notables,' which was called (June 24) to deliberate upon the best form of government, decided in July, by a vote of 231 to 19, in favor of a 'Limited Hereditary Monarchy,' with a Rom. Cath. prince for sovereign, under the title 'Emperor of Mexico,' and resolved in the first place to offer the crown to the archduke Ferdinand *Maximilian* (q.v.) of Austria; failing whom, to request the good offices of Emperor Napoleon III. in obtaining another monarch. That this resolution was the fruit of a general earnest wish on the part of the

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Mexican notables, the feeble and almost unwilling support that most of them accorded to their chosen emperor after his desertion by the French renders utterly improbable; but, on the other hand, there is no evidence that anything approaching intimidation or undue influence was exercised by the French. Most of the Mexican notables doubtless argued that a govt. supported by France would be sufficiently powerful to maintain the country in tranquillity, and in the hope of this long-wished-for result, cast in their lot for empire. These changes were, of course, vigorously protested against by the republican assembly at San Luis, and the two parties prepared with eagerness to try the fortune of war. Oct. 1, Forey departed from Mexico, and Gen. Bazaine took the command of the French forces, and began the campaign with vigor. The result of the winter's struggle was that in spring the imperialists were in possession of the whole country, with the exception of the four northern provinces. 1863, Oct. 3, Archduke Maximilian had given audience at his château of Miramar, near Trieste, Austria, to a deputation sent to offer him the crown, and had accepted it. May 29, the emperor and empress landed at Vera Cruz, and, June 12, made their public entry into the capital; and soon after the middle of the year, the imperialists had gained possession of every state in the kingdom, Juarez fleeing in Aug. to the United States. As small parties of the republicans still maintained a species of guerilla warfare in various districts, Maximilian, 1865, Oct. 2, published a proclamation, menacing with death, according to the laws of war, all who were found in armed opposition to his govt.; the republic having ceased, not only by the express wish of the nation, but also by the expiry (1864, Nov. 22) of Juarez's term of office, and his flight beyond the frontiers; an amnesty, however, being accorded to such as submitted before Nov. 15. In accordance with this edict, Generals Arteaga and Salazar, who were defeated and captured Oct. 13, were shot on the 21st; and many hundreds of captured republicans were dealt with under the terms of the same severe order.

This contest in M. had from the commencement excited the liveliest interest in the United States, though the war of secession, then raging there, prevented any active interference in the affairs of the neighboring state. A general impression existed that France had taken advantage of the troubles of the United States to establish its authority firmly on the American continent; and this belief, with the violation of the 'Monroe doctrine' by the establishment of imperialism in M., induced the United States to give all their sympathy and diplomatic aid to Juarez and his supporters. 1865, Nov. 6, Sec. Seward forwarded a dispatch to Paris, in which it was stated that the presence of the French army in M. was a source of 'grave reflection' to the U. S. govt., and that the latter could on no account allow the establishment of an imperial govt., based on foreign aid, in M.,

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or recognise in that country other than republican institutions. This dispatch led to an interchange of diplomatic notes during the following six months; the Americans holding firmly to their first statements, and even intimating the probability of an armed interference on behalf of Juarez; till the French emperor, who was wearied with a contest so expensive and, though successful, so barren of lasting fruits, ultimately agreed, in the summer of 1866, to withdraw his troops from M., having expended there about \$40,000,000. The Belgian legion and some Austrian levies, however, were not included in this arrangement. Accordingly, from the autumn of 1866 till 1867, Feb., the French troops by degrees evacuated M.; there was a fresh rising of the Juarists; and Juarez returned to power as president: see MAXIMILIAN: JUAREZ.

May 15 the emperor was captured; he was tried, condemned, and, June 19, was shot, with his two generals, Miramon and Mejia. July 16 Juarez re-entered the capital, and, Oct., was re-elected president, after having put down an insurrection by the capture and banishment of its head, Santa Anna, at Sisal, 1867, July 12. Several other insurrections followed in 1868, 9, of which the most formidable was that of Angel Santa Anna, who was captured after 4 months, and with his followers was shot. 1871 Juarez was again elected, his competitors being Porfirio Diaz and Lerdo de Tejada; he died 1872, July 18. He was the first president who had held his office during an entire term; and he succeeded in his work of reconstruction so far as to insure something like a stable government for M. He was succeeded by Don Sebastian Lerdo de Tejada, who had been minister of foreign affairs under Juarez, and was a skilled diplomat, and who maintained the affairs of the republic in a satisfactory condition. But his re-election, 1876, was followed by a revolution, headed by Gen. Porfirio Diaz, who drove out Tejada and his cabinet, and took control of the govt. He succeeded in restoring the country to order and quiet; but at the quadrennial election, 1880, he was defeated, and Gen. Manuel Gonzales was declared president. Under him the finances were brought into a very disordered state; and in 1884 Gen. Diaz was again elected to the presidency; and re-elected 1888; again re-elected 1892, a special constitutional amendment being made to render this possible; he was again re-elected 1896, and entered upon his fifth presidential term of four years. He is a strong and skilful ruler, and has the personal confidence of the country as an upright and patriotic man. There have been a few revolutionary outbreaks during his administration, but he has promptly and vigorously suppressed them.

The republic is divided into 27 states, 1 federal district, and 2 territories. Chief cities are the capital, Mexico, with pop. (census of 1900) 344,721; Guadalajara, 101,208; Puebla, 93,521; San Luis Potosi, 61,019; Guanaajuato, 41,486; Leon, 58,426; Monterey, 62,266; Aquascalientes, 35,042; Merida, 34,630; Vera Cruz, 24,085;

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Oaxaca, 35,049; Morelia, 37,278; Pachuca, 37,487; Zacatecas, 32,856; Saltillo, 23,996. The est. annual income 1896, was \$45,234,000; the expenditures \$46,068,000. Of the total exports of \$90,854,000 in 1894-5, \$67,322,896 went to the United States. The chief of these exports were silver, hemp, coffee, hides and skins, cabinet and dye-woods, tobacco, vanilla, cattle. The wholesale trade of M. is nearly controlled by German houses, which have almost driven out the English by their system of long credits. The dry-goods trade is monopolized by the French. American interests, though without treaty protection, amount to over \$200,000,000. The merchant marine of M. (1894) of vessels over 100 tons comprised 14 steamers of 4,006 gross tonnage and 15 sailing vessels of 3,091 tons net tonnage. There has in recent years been great progress in building railways; 1879 there were 372 m. in operation; 1895 about 6,322 m. Of the telegraph system 26,152 m. belonged (1895) to the federal govt. and 13,041 to individual states of the republic, to railroads and private companies; total 39,193 m. Everything entering into the construction of telegraph and telephone lines has been declared free of duty by the govt. Several new silver mines, recently discovered, have added to the wealth of the country. There are in M. 3,167 mining enterprises, of which two-thirds belong to Mexicans, the rest to foreigners. In 1893 the production of gold was 4,320 lbs., valued at \$1,326,564; of silver 3,036,255 lbs., valued at \$56,467,431. A fresh impetus has been given in late years to the mining of quicksilver, of which there are many rich mines in the country. As soon as the leases of the various mines expire, the govt. will take control of them. The present general condition and prospects of M. are very good; peace and order are established, and the republic seems more firm than ever before. See Prescott, *Conquest of M.*; Chevalier, *Mexique*; works by Alaman, Lefèvre, Kendall (1872), and Brocklehurst, *Mexico To-day* (1883).

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MEXICO, or MEJICO: city, capital formerly of the Spanish colony of New Spain, present cap. of the republic and the state of Mexico; $19^{\circ} 20'$ n. lat., and $99^{\circ} 5'$ w. long.; nearly 7,500 ft. above sea-level, in the valley of Tenochtitlan, $2\frac{1}{2}$ m. w. of Lake Tezcuco; 173 m. by rail from Vera Cruz, on the Gulf of M., 290 m. from Acapulco, on the Pacific, 863 m. from Matamoras, on the United States boundary. Pop. (1900) 344,721. The pop. at the time of the Spanish conquest was probably not far from 500,000. This beautiful city is built on the site of the ancient Tenochtitlan, cap. of the Aztec empire, on an extensive plateau of 1,400 sq. m., surrounded by lofty mountains and including five lakes. The principal streets of the city, which all converge toward the great square, are regularly and well laid out, broad, clean, and well paved and lighted; but the buildings, both private and public, are low and of light architecture, in consequence of water being found in many parts of the city at only a few feet below the surface, and partly from apprehension of earthquakes. The Plaza Mayor, one of the finest squares in the western world, contains the cathedral, the largest and costliest church in America, erected on the ruins of the great *teocalli*, or temple of the god Huitzilopochtli, titular god of the Aztecs (though M. is named after the god Mexitli), and adorned with the *kellenda*, a circular stone, covered with hieroglyphics, by which the Aztecs used to represent the months of the year. The cathedral, founded 1573, finished 1657, whose walls alone cost \$2,000,000, is in form a Greek cross, 426 ft. long, 203 ft. wide: it has two naves, 20 side chapels, a sumptuous high altar, and an elaborately carved choir whose balustrade of rich metal is valued at \$1,500,000. The interior is Doric, exterior Renaissance: its two open towers are 218 ft. high. M. has the finest collection of pictures in America, a national library of more than 100,000 vols., with priceless literary treasures, and a mint which since 1690 has issued coinage, chiefly silver, to the amount of more than \$2,000,000,000. The palace of the Cortes, in the same square with the cathedral, consists of various buildings appropriated to offices of state, govt. schools, and public institutions of various kinds; but, like everything else in Mexico, has been suffered gradually to fall to decay since the evacuation of the Spaniards. M. contains 44 Rom. Cath. and 6 Prot. churches, some monasteries and convents, and numerous charitable institutions; the fine hospital has been converted into a barrack. There are schools of jurisprudence, medicine, agriculture, engineering, and an acad. of the fine arts, containing very valuable Aztec antiquities; also several theatres and a circus: the bull-ring was demolished 1874. In addition to the ordinary *alameda* or public walk of a Spanish city, M. is remarkable for the extent and beauty of its *paseos*, or raised paved roads, planted with double rows of trees, which diverge far into the country from every quarter of the city. There are still a few of the water-gardens for which the ancient city was celebrated;

MEXICO.

and though no longer floating, as in the days of the Aztecs, they form attractive objects in the midst of the surrounding swamps which, have now been scientifically drained. The trade is chiefly a transit-trade, though there are a few manufactures—e.g., cigars of superior quality, gold-lace, hats, carriages, saddlery, etc.; and these articles, together with gold and silver, and some of the numerous valuable natural products of the Mexican plain, are transported to Vera Cruz and other ports: in return the manufactured goods of Europe and various colonial products are imported.

During the past 10 years the development of M. has been phenomenal. In 1880 there was only one railroad in the country—that from Vera Cruz to M. (400 m.)—and the great bulk of transportation was by mules. Gen. Grant's interest in the country and city did much to attract capital to both; and 1887 there were 4,000 m. of railroad completed and many more under construction. American, English, German, and some Spanish capital has been applied to the development of the vast natural resources of the country, and the enlargement of means of communication; at present the city is connected with the ports and chief towns in the country by the Mexican Central, International, National, and Mexican Pacific railroads; and a line between Tuxpan and the capital was contracted for 1889. The valley of M., surrounding the capital, is being drained by means of the Tesquisquiac tunnel, for which a seven-per cent. loan of \$2,000,000 was negotiated in London 1888.

MEXICO: a city in Mo.; a railroad centre, cap. of Audrain co.; on a branch of Salt river, 108 m. n.w. of St. Louis, 50 m. n. by e. of Jefferson City. It has nine churches, two newspaper offices, three banks, a high school, and an excellent seminary for girls, known as Hardin College. The co. court-house is a fine and substantial structure. There are various manufactures, including plows and woolen goods. Pop. (1900) 5,099.

MEXICO, GULF OF: basin of the Atlantic Ocean, about 800 m. in greatest width from n. to s., and about 1,100 m. in greatest length westward from the s. point of Florida; estimated area 800,000 English sq. m.; closed in by the United States on the n., by Mexico on the w. and s. Its outlet on the e. is narrowed by the jutting peninsulas of Florida and Yucatan, which approach within 500 m. of each other. In the middle of this entrance is the island of Cuba, dividing the strait into two—the Strait of Florida, 120 m. wide, between Cuba and Florida, and the Strait of Yucatan, 105 m. wide, between Cuba and Yucatan. The former or n. entrance connects the gulf with the Atlantic Ocean; the latter or s., with the Caribbean Sea. The depth of water is supposed nowhere to exceed three-fourths of a mile, yet the gulf contains few islands—the Florida Keys, the deltas of the Mississippi, and a few on the coast of Yucatan, being the most important. The shores, which are very sinuous,

form numerous bays, the largest of which is the Bay of Campeachy (q.v.). The coasts are mostly low and sandy or marshy, and are lined with numerous lagoons; good harbors are consequently not numerous, the best being those of Vera Cruz, New Orleans, Pensacola, and Havana. The gulf is visited by violent northern gales called *nortes*, which prevail after Sep., attaining their maximum force in Mar., and then immediately terminating. The most remarkable feature in connection with the Gulf of M. is the *Gulf Stream* (q.v.), which enters it by the s. channel, passes round it, and emerges through the Strait of Florida. Owing partly to the presence of this heated current, the temperature of the gulf is 8° or 9° higher than that of the Atlantic in the same latitude.

MEYER, *mī'ēr*, HEINRICH AUGUST WILHELM, TH.D.: 1800, Jan. 10—1873, June 21; b. Gotha. He was educated at the gymnasium at Gotha, and graduated from the Univ. of Jena 1820. In 1823 he became pastor of a church at Osthausen. In 1829 he published the first part of his great critical and exegetical commentary on the New Testament; the second part appeared 1832; and to the end of his life he was engaged on this great work, which was to have been completed in 16 divisions, but was not completed by him. New editions of the separate vols. were continually called for during his life, and he was kept busy revising and rewriting them from year to year. From the first his commentary was recognized, as it still is, as the most thorough, scholarly, and trustworthy work of the kind in existence. His method is the grammatico-historical, acutely critical, yet evangelical in spirit. An English translation of the commentary has been published in Edinburgh, edited by Drs. W. P. Dickson, of the Univ. of Glasgow, and F. Crombie, of St. Mary's College. Recently an American edition, edited by a number of leading biblical scholars, has been published. In its particular field, M.'s work is still without a rival. In 1830 he published his valuable *Libri symbolici Ecclesiae Lutheranae*. He continued active as a pastor and supt., preaching regularly, until 1848; became general supt. at Hanover 1861; and retired from official life in impaired health 1865, though still residing at Hanover, where he died.

MEY'ER. JOHANN GEORGE (known as Meyer von Bremen): 1813, Oct. 28—1886, Dec. 4; b. Bremen. Studied art at Düsseldorf, 1833-42; and opened a studio there, where he began painting religious subjects on a large scale. He soon changed his style to that in which all the works on which his fame rests have been executed. Filled with the spirit of Meissonier, he began that series of domestic subjects, with studies of children, on diminutive canvas, conceived with tenderest pathos, and executed in every minute detail with exquisite finish, which have made him famous and a general favorite not only in his own country, but also in England, France, and the United States. In 1852 he established himself in Berlin, and so

great is the demand for his pictures, popular in theme, small in size, rich in color, and perfectly finished, adapting them peculiarly for home adornment and as parlor pictures, that they are usually sold to private purchasers before they can be secured for the great exhibitions. Many of his best pictures have been engraved and have become familiar to the public. Such are *The Widow's Evening Prayer with Her Children*, *The Return of the Soldier of the Landwehr*, *The Very Small Brother*, *The First Prayer*, and others. The first and third of these were exhibited at the Paris exposition of 1855. Many of his paintings are owned in the United States.

MEYERBEER, *mī'ér-bār*, GIACOMO (known in Germany first as JAKOB MEYER BEER): celebrated musical composer: 1791 (or 4), Sep. 5—1863, May 2; b. Berlin; son of a wealthy Jewish banker. He was a precocious child, playing tunes on the piano spontaneously (it is said) as early as his fifth year. He began to study dramatic composition under Bernhard Anselm Weber; and 1810 entered the school of Vogler at Darmstadt, where he formed an intimate friendship with the renowned Karl Maria von Weber. While at Darmstadt, he wrote a cantata, *Gott und die Natur*. Subsequently, he composed an opera, *Jephthah*, produced at Munich 1812; but though warmly admired by his friends, Vogler, Weber, and others, it fell flat on the audience, and was considered a failure. He then went to Vienna, where he acquired brilliant reputation as a pianist; but another opera which he produced here by command of the court, *Die beiden Khalifen*, was no more successful than the previous one. Italian music was the rage at the time, and nobody had a chance who did not imitate Rossini. M. was induced by his friend Salieri to visit Italy, where he became an enthusiastic convert to the new Italian school, and began the composition of a series of operas which proved highly popular. Among these are *Romilda e Constanza* (performed at Padua 1819), *Semiramide* (Turin 1819), *Emma di Resburgo* (Venice 1820), the first of M.'s compositions that excited a furor; *Margherita d'Anjou* (1822), *Esule di Granada* (1823), and *Crociato* (Venice 1825). The last of these afforded, perhaps, the most decisive proofs of the high genius of its composer, and was received with great applause in Paris, whither M. then went to reside. In 1831 was produced, after numerous rehearsals, his grand dramatic opera *Robert le Diable*, which caused an excitement 'perhaps unparalleled in the history of the Parisian stage;' while it was received with nearly as great enthusiasm in England, Italy, Austria, and Russia, and later in America; and, 1836, *Les Huguenots*, in which M. reached the climax of his fame. His next opera, *Le Prophète* (1849), fairly sustained his reputation. It was followed by *Pierre le Grand* (1854), *Dinorah* (1858), and *L'Africaine* (1865).

MEZEN, or MEZENE, *měz-ān'*: district town in the govt. of Archangel, European Russia, 50 m. from the mouth of the river M.; remarkable for the salmon and herring fisheries which supply St. Petersburg with frozen fish during the winter. Pop. (1880) 1,850.—The river MEZEN, or Mezene, rises in the n. of the govt. of Vologda, European Russia, and flows n.w. into the White Sea, having a course of about 450 miles.

MEZEREON, *mě-zě'rě-ōn* [F. *mézéréon*]: flowering shrub whose extremely acrid bark has been used in medicine as a diaphoretic in cutaneous and syphilitic affections, though it is a powerful irritant, and is of doubtful advantage; the bark of the *Daphne mezēreūm*, ord. *Thymelacēæ*: see DAPHNE.

MÉZIÈRES, *mā-zē-ār'*: fortified town of France, cap. of the dept. of Ardennes, on a bend of the Meuse, which washes its walls on two sides and separates it from Charleville (q.v.). It was strongly fortified by Vauban, and is defended by a citadel. It communicates with Charleville by a suspension-bridge. In 1815 the town held out for two months against the Allies, who besieged it after the battle of Waterloo. Over the n. aisle of the church is a bomb-shell, which has been sticking there ever since the town capitulated. In 1520 the Chevalier Bayard, with 2,000 men, successfully defended it against 40,000 Spaniards under Charles V. In the Franco-German war 1871, M. capitulated after a cannonade of two days. Pop. 6,000.

MEZÖ-TUR, *mā'zö-tôr'*: town of Hungary, on the Berettyo, an affluent of the Körös, 60 m. s.w. of Debreczin. Pottery is made, and there is an important market. Pop. (1880) 21,213; (1890) 23,757.

MEZQUITE, *mēs-kēt'*, Sp. *mēs-kē'tā*: name of two Mexican trees or shrubs, of nat. order *Leguminosæ*, sub-order *Papilionacēæ*, bearing pods filled with a nutritious pulp. The COMMON M. (*Algarobia glandulosa*) is a small shrub, with stems often decumbent, and armed with strong straight spines. It is found in great profusion throughout vast regions, chiefly dry and elevated plains. In dry seasons, it exudes a great quality of gum (*Gum Mezquite*), similar in quantity to gum-arabic, which seems likely to become a considerable article of commerce, and which has begun to be exported to San Francisco from the Mexican ports on the Pacific.—The CURLY M., or SCREW M. (*Strombocarpa pubescens*), called also SCREW BEAN and TOURNIL, though only a shrub or small tree, is of great value in the wild and desert regions of western N. America, where it occurs with willow-bushes near springs of water. Its wood is used as fuel, and the pulp of its pods for food. The pods are spirally twisted into compact rigid cylinders, from an inch to an inch and a half in length.

MEZZANINE—MEZZOTINT.

MEZZANINE, n. *mědz'ă-nēn* [It. *mezzanino*—from *mezzano*, middle]: a low intermediate story between two higher ones.

MEZZO, a. *mět'zō* [It. *mezzo*, middle—from L. *mediūs*, middle]: in *music*, middle; mean. MEZZA-FORTE, moderately loud. MEZZO-PIANO, rather soft. MEZZA-VOCE, with moderated force of tone. MEZZO-ORCHESTRA, with half the orchestra. *Mezzo* alone, applying to the grand pianoforte, calls for use of the pedal, avoiding one of the sets of strings. MEZZO-RELIEVO, n. *mět'zō-rā-lě'vō* [It.: see RELIEVO]: middle or demi relief. MEZZO-SOPRANO, n. *mět'zō-sō-prā'nō*, a medium or half soprano: see SOPRANO; the female voice so called; the person having such a voice: ADJ. having a medium compass of voice, between the soprano and contralto, said of a female voice.

MEZZOFANTI, *měd-so-fân'tē* or *mět-so-fân'tē*, GIUSEPPE, Cardinal: remarkable linguist: 1774, Sep. 17—1849, Mar. 15; b. Bologna, where he received his education, and subsequently (1815) received the office of university librarian. In 1831 he settled in Rome, and was advanced to the dignity of a Monsignore; 1833 he was appointed sec. of the College of the Propaganda; then keeper of the Vatican Library; and 1838 he was raised to the dignity of cardinal. He died at Rome. M.'s European reputation was founded not on any literary or learned works that he wrote, but on the almost miraculous extent of his linguistic acquisitions. Toward the end of his life, he understood and spoke 58 different tongues. As early, indeed, as 1820, Lord Byron called him 'a walking polyglot, a monster of languages, and a Briareus of parts of speech.' He was not in the strict sense a critical or scientific scholar; yet, though his linguistic skill lay chiefly in verbal knowledge, his acquirements in other departments were considerable. See Russell's *Life of Cardinal Mezzofanti* (Lond. 1858).

MEZZOJUSO, *mět-sō-yō'sō* (Arab. *Menzil-Jussu*, village of Joseph): town of Sicily, province of Palermo, 18 m. s.s.e. of Palermo city. It is one of the four colonies of Albanians, who, on the death of Scanderbeg, 15th c., fled to Sicily, to avoid the oppression of the Turks. They preserve their language to a great extent, and in religious observance follow the Greek ritual, their priests being allowed to marry; but, except on fête-days, they are not distinguishable in feature or dress from the peasantry of the rest of Sicily. Pop. 6,700.

MEZZOTINT, n. *měz'zō-tint* or *mět'zō-tint*, or MEZZO-TIN'TO, n. *-tīn'tō* [It. *mezzotinto*—from *mezzo*, middle, half; *tinto*, tint—from L. *tinctus*, dyed, tinged]: style of engraving on copper in imitation of Indian ink (see ENGRAVING): a certain style of drawing.

MGLIN—MIAMIS.

MGLIN, *mglēn*: town of Russia, govt. of Tchernigov, 125 m. n.n.e. of the town of Tchernigov. There is a large cloth-factory, and a considerable number of German families. Pop. (1880) 6,200.

MHENDIGUNJ: town of British India, territory of Oude, 90 m. s.e. of Lucknow, 3 m. s. of the right bank of the river Sae. It is a busy, thriving place. Pop. estimated 20,000.

MHOW, *mhow*: town of British India, territory of Indore, 13 m. s.w. of the town of Indore, near the Vindhyan Mountains, on an eminence on the Gumber river. Near it are the cantonments, which have altogether the appearance of a European town, having, on an eminence, a church with steeple, a spacious lecture-room, a well-furnished library, and a theatre. They are 2,019 ft. above sea-level. Pop. of M. (1881) 27,227.

MI, *mē* [It. and F.]: in *music*, the third note of the scale = E.

MIAGAO, *mē-â'gô-ō*: town in the island of Panay, one of the Philippine Isles, province of Iloilo. The inhabitants are industrious, comfortable, and well educated. Pop. (1899) 22,100.

MIAKO, *mē-â'ko*, or **SAI-KIYO**, *sī-kē'yo*: ancient cap. of Japan: see **KIOTO**.

MIAMI, *mī-âm'ī* or *mē-ām'ē*, **RIVER**: stream in Ohio, rising by several branches in the w. centre of the state, and after a s.s.w. course of 150 m. through one of the richest regions of America, past the important cities of Dayton and Hamilton, empties into the Ohio river, 20 m. w. of Cincinnati. It is sometimes called Great M., to distinguish it from Little M., a smaller river, which runs parallel to it, 15 to 25 m. e., through the Miami Valley.

MIAMIS: tribe of Algonquin Indians whom the French met near Green Bay, Wis., 1658. About 8,000 of them also were found, 1670, at the head of the Fox r., living in a palisaded village, in houses of matting, and displaying higher character and social relations than usual among the northern tribes. In 1683 they were attacked by the Iroquois, on the St. Joseph r., and at the same time were at war with the Sioux. In 1686 they came into collision with the French, and finally made agreement with the English, joining the Iroquois against the Hurons, and threatening the Chippewas. In 1705 the French involved them in a war with the Ottawas. At the outbreak of the French and Indian war, they hesitated which side to join, but on the whole favored the English, and, 1751, were attacked by the French. Afterward they joined Pontiac, and took the British forts Miami and St. Joseph's. During the Revolution they sided with the English, but were forced to make peace by Clarke; but a hostile attitude against the encroaching settlers was maintained, until, 1790, Gen. Harmar was sent against them. Under Little Turtle their 1,500 warriors defeated Gen. Hardin twice, also Gen. St. Clair;

MIANTONOMOH—MIASMA.

Gen. Wayne, however, routed them, 1794, Aug. 20, at Maumee rapids; and, 1795, peace was concluded. They ceded their lands after this, and rapidly declined in character and numbers. They joined in Tecumseh's movement, but were defeated, and made peace 1815, Sep. 8. After various cessions of land and treaties, they were, 1846, removed to the Ft. Leavenworth, Kan., reservation. In 1873 only about 150 of them remained, who were removed to the Quapaw reservation.

MIANTONO'MOH: Indian sachem of the Narragansett tribe, successor, 1636, of his uncle Canonicus. He was friendly with the early colonists of Mass., and on their side in the Pequot war. But later (1642) he attacked the Mohegan sachem Uncas, who captured him at Norwich, Conn. Uncas submitted his case to the commissioners of the colonies, who decided that M. had shown himself a dangerous public enemy; whereupon Uncas's band tomahawked him, on the plain, since called Sachém's Plain, now marked by a monument erected 1841.

MIASKITE, or **MIASCITE**, n. *mě-ăs'kīt* [*Miask*, in Siberia]: a granite rock, consisting of cleavable white felspar, black mica, and grayish or yellowish-white elæolite with some hornblende.

MIASMA, n. *mĩ-ăz'mă*, or **MIASM**, n. *mĩ-ăzm'* [Gr. *mi-asma*, defilement—from *miainein*, to stain, to pollute: It. *miasma*: F. *miasme*]: noxious exhalation floating in the air, arising from decaying, diseased, or poisonous substances: often in the plural **MIASMATA**, *mĩ-ăz'mă-tă*, malaria. **MIAS'MAL**, a. *-măl*, containing *miasma*. **MIASMATIC**, a. *mĩ-ăz-măt'ik*, pertaining to *miasma*, or containing it.—*Miasma* is often popularly identified with **MALARIA**, though malaria refers rather to the *air* as tainted with noxious effluvia. A familiar form of *Miasma* is the poisonous exhalation arising from marshes. It is proved by the experience of all ages that there is intimate connection between marshy districts and certain diseases, especially the various forms of intermittent and remittent fever; but the exact nature of the noxious agent, and the circumstances on which its formation and extrication depend, are not fully known. M. is clearly neither heat nor moisture; for the crews of clean ships cruising in the tropics, at a distance from land, are usually very healthy; nor is it any known gas extricated from the marsh, for the gases collected by stirring up marshes (carbonic acid, nitrogen, oxygen, and carburetted hydrogen) may be inspired without giving rise to any malarial symptoms. It may be regarded as established that the noxious agent is a product of vegetable decomposition under certain conditions of heat and moisture. This is inferred from the fact that this special morbid influence is nowhere so powerful as in the deltas and along the banks of large tropical rivers, which, in their flood, bring down the washings of the soil, full of vegetable remains, which, by the subsidence of the waters,

MIASMA.

are left reeking in the hot sun. Moreover, the poison has been traced, in various places in Italy, France, and the Netherlands, to the practice of steeping flax in stagnant waters, and even in streams; and in India, it was formerly the custom, after extracting the coloring matter from indigo, to throw the remains of the plant into large heaps, which, in the course of three years, became excellent manure: it was found, however, that these heaps, alternately soaked by the heavy rains and heated by a tropical sun, decomposed and emitted miasmata precisely similar in their effects to those produced by marshes. Marsh-miasmata are seldom evolved at a temperature under 60° , but at and above 80° they are prevalent and severe; and the nearer the equator, the more violent, as a general rule, do they become. Although moisture is necessary to the evolution of miasmata, an excess of it often acts as a preventive, and by impeding the access of atmospheric air, retards or prevents decomposition. This explains the apparent anomaly of an uncommonly rainy season producing opposite effects in different localities, sometimes not distant from one another. Thus, in the W. Indies, a very rainy season induces general sickness in the dry and well-cleared island of Barbadoes; while at Trinidad, whose central portions are 'a sea of swamp,' and where it rains nine months in the year, the excessive rain is a preservative from sickness; for in the seasons when rain falls only eight months or less, the swamps become dry and exposed to the sun, and severe remittent fevers are sure to follow.

Chemistry has hitherto failed in detecting any special ingredient to which the air evolved by marshes owes its poisonous qualities. The air collected in the most poisonous districts gives, on analysis, the same gases existing in the same proportions as normal air; nor (if we except the observations of Boussingault, not yet confirmed by other chemists) does it give evidence of the presence of any organic body.

The infecting distance of this poison is a subject of great practical importance; and both the altitudinal range and the horizontal spread have to be noticed. In Italy, it is estimated that an altitude of about 1,500 ft. assures exemption from marsh-poison; while in the W. Indies an elevation of at least 2,000 ft. is necessary. From observations by Sir Gilbert Blane, during the ill-fated Walcheren expedition, it appears that, in Europe, the horizontal spread of marsh-miasmata over fresh water is less than 3,000 ft.; but over salt water—at all events, in the tropics—the horizontal range is greater. The extent to which the poison may spread horizontally over land is a much more complicated question, and depends largely on the nature of the soil. The effect of trees in intercepting miasmata is remarkable, and is probably due partly to their condensing the vapors of the marsh, and partly to their altering the direction of the current of air. Pope Benedict XIV. caused a forest to be cut down which separated Villatri from the Pontine Marshes, and in con-

MIAUL—MIAVA.

sequence, for many years, there was a most severe and fatal fever in a district previously healthful; and the same results have in many other cases followed the removal of trees.

In districts where this poison exists, it is found by experience that those who go out of their houses only during the day, after the morning fogs have dispersed, and before the evening mists appear, often escape the bad effects; and a full meal, with a few grains of quinine, before exposure to the morning air is found protective by travellers in a malarious district.

Dr. Wood of Philadelphia has pointed out the extraordinary and very important fact, that miasmata are usually neutralized, decomposed, or in some other way rendered innocuous by the air of large cities. Though miasmatic diseases may rage around a city, and even invade the outskirts, yet they are unable to penetrate into the interior, and individuals who never leave the thickly-built parts almost always escape. What in the air of the city is thus incompatible with the miasmatic effect of marshes, is unknown; but probably the protection is connected with the results of combustion, for the fire and smoke of camps are asserted to have had the same effects.—See ENDEMIC.

MIAUL, v. *mē-owl'* [an imitative word: F. *miauler*, to mew as a cat: It. *miagolio*, the caterwauling of a cat]: to cry or caterwaul as a cat. MIAULING, imp. *mē-owl'-ing*, crying as a cat: N. the cries or crying of a cat. MIAULED, pp. *mē-owld'*.

MIAUTSÉ, *mē-ow-tsā'*: tribe of the aborigines or hill-tribes of China. From the dawn of Chinese history, we find the people of the plains contending against those of the high lands, and to the present day many of the hardy mountaineers have maintained practical independence. They consist of numerous uncivilized tribes, occupying large mountainous portions of Kwang-se, Kwei-chow, Yunnan, Sze-chuen, and adjacent provinces. Some of them own Chinese sway; but over many portions of them no real jurisdiction is ever attempted by the Chinese govt., which contents itself with a shadowy claim of sovereignty: these govern themselves on a patriarchal system. The M. are smaller than the Chinese, and unlike in features as in character. Their dialects are various, and wholly different from the Chinese. The M. of w. China are of the same stock as the Shans and Karens of Siam and Burmah.

MIAVA, *mē-ōh'vōh*: market-town of n.w. Hungary, on the Miava, an affluent of the Morava, 48 m. e.n.e. of Presburg city. There are manufactures of woollen cloth and bagging, and hemp and flax are cultivated. Pop. (1880) 10,020.

MICA—MICADO.

MICA, n. *mī'kă* [Sp. and F. *mica*—from L. *micārē*, to sparkle, to glitter]: a mineral, called also *Muscovy Glass*, consisting essentially of a silicate of alumina, with which are combined small proportions of silicates of potash, soda, lithia, oxide of iron, oxide of manganese, etc. By these and slight external differences, mineralogists have distinguished numerous species. **MUSCOVITE**, or **COMMON M.**, also called **POTASH M.**, contains a notable but variable proportion of silicate of potash; also a little fluorine. It is a widely diffused and plentiful mineral, entering largely into the composition of granite, mica-slate, and some other rocks, veins and fissures of which it also often fills. It has a strong, often almost metallic lustre. It is remarkable for the readiness with which it splits into thin elastic plates, generally transparent, or at least translucent. The thinness and elasticity of these plates readily distinguish them from those of talc, and of the laminated variety of gypsum; also they are devoid of the greasy feel of talc. They are sometimes not more than one-300,000th of an inch in thickness, are mostly quite transparent, and were formerly much used in setting objects for the microscope; but for this purpose thin glass is now generally preferred. Plates of M., often a yard across, are found at the M. quarries at Acworth, N. H., also near Lake Baikal in Siberia, and in China. They occur of large size also in Sweden and in Norway; and the mineral is found in large masses in St. Dennis and other parts of Cornwall, England. In Siberia, China, Peru, and elsewhere, M. is substituted for glass in windows. At one time it was used for this purpose in the Russian navy, not being liable, like glass, to be broken at the discharge of cannon. It is sometimes preferred to glass for lanterns, and especially for the fronts of stoves, as not liable to break with sudden change of temperature. It is useful also for the mounts of natural history objects which are to be put in spirit, being more easily bored than glass. In India, small pictures are frequently painted in distemper on mica. Muscovite is usually colorless or of pale amber tint, but it occurs also white, gray, brown, green, dark olive, and, rarely, rose-red. It is found sometimes in beautiful crystals, generally rhombic or in six-sided tables.—**LITHIA M.**, or **LEPIDOLITE**, occurs massive in a scaly-granular form at Rozena in Moravia, of fine purple or reddish-violet color. This is a very beautiful mineral, and, like jasper, lapis-lazuli, etc., is made into ornaments. That found in Great Britain is not of such delicate color as that found in Moravia.—**MAGNESIA M.**, or **BIOTITE**, contains about as much magnesia as alumina. It is often dark green. **MICACEOUS**, a. *mī-kă'shūs*, pertaining to or containing mica. **MICA'-CEO-CALCA'REOUS**, *mī-kă'shī-ō-*, partaking of the nature of, or consisting of, mica and lime, applied to mica-schist (q.v.) containing carbonate of lime.

MICADO, n. *mī-kă'dō*: see **MIKADO**; **TYCOON**,

MICAH—MICA-SLATE.

MICAH, *mī'ka*: sixth (third in the LXX.) of the 12 minor prophets of Israel; b. probably at Moresheth, near Gath, in Judah. He prophesied mostly in Jerusalem, during the reigns of Jotham, Ahaz, and Hezekiah (B.C. 722—prob. B.C. 711), and was therefore contemporary with Isaiah, and Hosea, and Amos. — His prophecy forms the **BOOK OF MICAH**, a canonical work of the O. Test.; divisible into three parts, each commencing 'Hear ye;' organically connected, however, with each other, and showing even a progressive development of idea in the mind of the writer. The natural divisions are: i. 2—iii. 1; iii. 1—vi. 1; vi. 1—vii. 20. The destruction of Samaria (Israel), the danger and subsequent captivity of Judah, the wickedness of the rulers, the punishments that overtake the land, the glorious restoration of the theocracy, Jehovah's 'controversy with his people' on account of their sins, his warnings, his exhortations, and his sublime promise of forgiveness, form the principal points of M.'s prophecies, which relate to the invasions by Shalmaneser, Sennacherib, the Babylonian exile, the return, and the re-establishment of the theocracy under Zerubbabel. Through the nearer cycle of predicted events, the prophet gives distant visions of the Messiah: the announcement that Bethlehem should be the place whence Messiah should come has always commanded attention (Mic. v. 1–15; comp. Matt. ii. 5, 6; Jn. vii. 42). The style of Micah is clear, vivid, concise, yet richly poetical; some passages, especially in the beginning and the last two chapters, are among the noblest in the Old Testament. The play upon words, noticeable in Isaiah, is a marked feature of this writer also.

MICA-SCHIST: next to gneiss, one of the most abundant of the Metamorphic Rocks (q.v.). It consists of alternate layers of mica and quartz, but is sometimes composed almost entirely of the thin and shining plates or scales of mica, and from this it passes by insensible gradations into clay-slate. The quartz occurs pure in thin layers like vein-quartz. Garnets are in some districts abundant in this rock, making up a large proportion of the whole mass. M.-S. is believed to be a highly altered shale or clay deposit, and the component minerals, including the garnets, to have been developed under the influence of metamorphic action from materials already existing in the unaltered strata. In many places, the M.-S. has a finely corrugated or wavy structure.

MICA-SLATE: a metamorphic rock, widely distributed, composed principally of mica and quartz, but sometimes containing felspar. It resembles Mica-Schist (q.v.) in some respects, and clay-slate in others, but is not usually classed with either. It contains a larger proportion of clay than the former, and the mica appears in smaller particles; in some specimens the mica can scarcely be detected without a glass. The rock usually presents a foliated appearance. Hydromica schist, or slate, con-

MICE—MICHAELIS.

tains hydrous mica with a small proportion of quartz. To the sense of touch it is like Talc (q.v.), and was formerly called talcose slate, but has been found entirely devoid of talc.

MICE, *mīs*: plu. of MOUSE, which see.

MICH, or MICHE, v. *mīch* [Swiss *mauchen*, to conceal: F. *musser*; prov. F. *mucher*; OF. *mucer*, to hide, to skulk]: in OE., to skulk; to lie hid out of view. MICH'ING, imp. MICHED, pp. *mīcht*. MICH'ER, n. -*ér*, one who.

MICHAEL, n. *mī'kēl*: a fine variety of sweet oranges, from the island of St. Michael, one of the Azores.

MICHAEL (or MIKAIL) FEODOROVITCH (ROMANOFF): see ROMANOFF.

MICHAEL VIII., surnamed PALÆOLOGUS, Emperor of Constantinople: see PALÆOLOGUS.

MICHAEL, *mī'kā-ēl* or *mī'kēl*, THE ARCHANGEL: the only archangel, or prince of the angels, named in the Bible; though post-exilian Jewish and popular Christian angelology have added others, to the number of seven, creating thus the highest order in the angelic hierarchy (see ANGEL: ARCHANGEL). M. is referred to in Dan. x. 13, 21; xii. 1; Jude 9; Rev. xii. 7. The Rabbinical traditions practically identifying M. with the Messiah are purely conjectural; though some Christian scholars have found reason for such conjecture in the Scriptural representation of M. as the great prince and leader of Israel. M. appears indeed as the type and leader of the children of God in their antagonism to heathen power, and their continual strife against Satan and his hosts—the great military leader who stands up with them and fights for them in the power of God. His contention with the devil about the body of Moses (Jude 9) seems an allusion to the Jewish tradition that, when M. was sent to care lovingly for Moses's body (see Deut. xxxiv. 6), he was withstood by the devil, who claimed it because the blood of the Egyptian (Ex. ii. 12) was on Moses's hands. (Cognate is Zech. iii. 1.)—M. is one of the saints in the Rom. Cath. calendar, and in that of the Prot. Episc. Church: see MICHAELMAS DAY.

MICHAEL-AN'GELO BUONAROT'TI: see MICHEL-ANGELO.

MICHAELIS, *mē-chā-ā'līs*, JOHANN DAVID: eminent biblical scholar: 1717, Feb. 27—1791, Aug. 22; b. Halle, where his father, Christian Benedict M., theologian and orientalist, was professor. After completing his studies at his native university, he travelled in England and Holland. In 1745 he became prof. of philosophy at Göttingen, and was active in forming a scientific assoc. there. 1753–70 he was one of the editors of the *Göttinger gelehrten Anzeigen*, and for some years he was librarian to the university. During the Seven Years' War, he made preparations for an expedition of discovery in Arabia, which was afterward made by Niebuhr.

MICHAELMAS—MICHEL.

In the latter years of his life, he was almost always in the professorial chair or at his desk. M. was a man of vast attainments in history and archaeology, and his labors were of great importance in the departments of Biblical Exegesis and History. He may be regarded as among the earliest of the critical school of German theologians, but he lived at too early a period to acquire anything like a consistent or systematic theory of the genesis of the Hebrew Scriptures. He loved to rationalize in details, and was never quite certain what to think about inspiration; at all events, he seeks constantly to prove how thoroughly *human* the Mosiac legislation was, though he does not exactly deny its claims to being considered a Divine revelation. Though with a decidedly rationalistic bent in theology, he always claimed to be orthodox; but he confessed that he could not subscribe fully to the Lutheran articles. He was deficient in imagination, and his works, very important in their influence on Hebrew study at the time, are now little read. Many of his pupils became professors, and disseminated his principles through the German universities.

M.'s chief works are *Einleitung in die göttlichen Schriften des Neuen Bundes* (2 vols. Gött. 1750; English by Bp. Marsh); *Mosaisches Recht* (6 vols. Frankf. 1770-75; English by Dr. Alexander Smith 1814); and *Moral* (3 vols. Gött. 1792-1823). See his *Lebensbeschreibung von ihm selbst abgefasst* (Rinteln und Leip. 1793).

MICHAELMAS, n. *mīk'ēl-mās* [after St. *Michael*, the archangel, and *mass*]: the feast of the archangel Michael, Sep. 29; thence sometimes equivalent to Autumn. This feast of the Rom. Cath. Church is said to have been instituted 487, in honor of all the angels with Michael at their head. The Greek and other Eastern churches observe it; also the Church of England, and the Prot. Episc. Church in the United States. MICHAELMAS-DAY is one of the English quarter-days for payment of rent by tenants—viz., Sep. 29. MICHAELMAS TERM is one of the four legal terms during which the English courts of law and equity sit daily for dispatch of business. It begins Nov. 2, and ends Nov. 25. Michaelmas Head Court was the name given in Scotland for the annual meeting of heritors or freeholders of each county to revise the roll of freeholders. MICHAELMAS DAISIES, the asters—so named from flowering late in the season; the seaside native aster is *Aster tripoliūm*, ord. *Compositæ* (see ASTER).

MICHEL, *me-shēl'*, LOUISE: French communist, author, editor of *La Révolution Sociale*: b. 1835 in the dept. of Marne. Her mother was servant of a noble family. L. was a favorite at the château and was well educated. When about 18 years of age she went to Paris, and taught in a school at Montmartre until the communal uprising 1871. She embraced the cause of the Commune with fierce enthusiasm, fought in the ranks with the insurgents, was tried by court-martial and sentenced to death. Sentence

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was commuted to transportation to New Caledonia. She was amnestied 1880 and welcomed in France by 30,000 people. She resides in Paris, caring for her aged mother, writing and lecturing in favor of the Commune. She hates religion and would destroy the present order of society by fire and sword; but is kind to children and animals, and self-sacrificing in behalf of the poor. Her courage, honesty, and ability are unquestioned. She was shot and seriously wounded while addressing a meeting of anarchists 1888. In 1890, Mar., she completed the libretto of a comic opera entitled *Dans la Lune*.

MICHELANGELO, *me-kěl-ân'jā-lo* (BUONARROTI, *bô-onâr-rôt'ē*): almost unrivalled as painter, sculptor, architect, in an age when Christian art had reached its zenith: 1475, Mar. 6—1564, Feb. 18; b. Chiusi, in Italy. He was of noble origin, descended on his mother's side from the ancient family of Canossa, in Tuscany, while the Buonarroti had long been associated with places of trust in the Florentine republic. M. learned the rudiments of painting from Bertoldo, pupil of Domenico Ghirlandajo; and having been admitted as student into the seminary established by Lorenzo the Magnificent for the study of ancient art in connection with the collections of statuary in the Medicean Gardens, he attracted the notice of Lorenzo by the artistic skill with which he had restored the mutilated head of a laughing faun, and was received into the palace of the Medici, where he spent several years. Lorenzo's death 1492, and the temporary reverses which befell the Medici family in consequence of the incapacity of his successor, Piero, led M. to retire to Bologna, whence he soon removed to Rome, whither his fame had preceded him. His earliest original works were a *Kneeling Angel*, executed for the grave of St. Dominic, at Bologna; the statues of Bacchus and David, at Florence; and a magnificent group representing the *Mater Dolorosa*, which was placed in St. Peter's, at Rome. The *David*, an impressively powerful colossus, the amazement of the youthful artist's contemporaries, was removed 1873 to a hall in the Acad. of Fine Arts. Next in order of time, and, according to some of his contemporaries, first in merit, ranks M.'s great cartoon for the ducal palace at Florence, which, with the pendant executed by Leonardo da Vinci, has long since perished. This work, which represented a scene in the wars with Pisa, when a number of young Florentines, bathing in the Arno, are surprised by an attack of the Pisans, showed so marvellous a knowledge of the anatomical development of the human figure, and such extraordinary facility in execution, that it became a study for artists of every land, and created a new era in art. Pope Julius II. called M. to Rome, and commissioned him to make his monument, which was to be erected within St. Peter's. Although this work was never completed on the colossal scale on which it had been designed, and was ultimately erected in the Church of St. Pietro ad Vincula,

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it is a magnificent composition, and is memorable for having given occasion to the reconstruction of St. Peter's on its present sublime plan, in order the better to adapt it to the colossal dimensions of the proposed monument. The pope insisted on M. painting with his own hand the ceiling of the Sistine Chapel. M. was unwilling, declaring that painting was not his work; but he began 1508, and completed within less than two years his colossal task, which proved one of the most marvellous of his works. The subjects of these cartoons are from the book of Genesis, while between these and the representations of the persons of the Savior's genealogy are colossal figures of prophets and sibyls. These frescoes on the ceiling of the Sistine Chapel illustrate what is best and grandest in this great painter's art. M.'s genius was too often trammelled by the unworthy tasks in which Leo X. and successive popes engaged him, the pope having employed him for years in planning and superintending the excavation of roads for the transportation of marble from Carrara, and in other ignoble labors. The Florentines and Bolognese vied with the pontiffs in trying to secure his services; and to his skill as an engineer Florence was indebted for the plans of the fortifications by which she was enabled for a prolonged time to resist the attempts of the Medici to recover possession of the city after their expulsion from it. On the surrender of Florence, he returned to Rome, where his great picture of the *Last Judgment* was painted for the altar of the Sistine Chapel. This colossal fresco, nearly 70 ft. in height, completed 1541, was regarded by contemporary critics as having surpassed all his other works for the unparalleled powers of invention and the consummate knowledge of the human figure which it displayed. It is probably the most famous single picture ever painted by human hands. Devoid of beauty and tenderness, it developed to an extreme all that was terrible in the fierce and bitter theology of that age. The Sistine *ceiling* pictures are far more Christian. After its completion, M. applied himself to the perfecting of St. Peter's, which, by the touch of his genius, was converted from a mere Saracenic hall into the most superb model of a Christian church. He refused all remuneration for this labor, which he regarded as a service to the glory of God. M. died at Rome, but his remains were removed to Florence, and laid within the church of Santa Croce. His piety, benevolence, and liberality made him generally beloved; and in the history of art no name shines with a more unsullied lustre.—See Vasari's *Vite de' Pittori* (Eng. trans.), and Lives by Duppa (1806), Harford (1857), Wilson (1876), and H. Grimm (Hanover, 5th ed. 1879).

MICHELET, *mēsh-lā'*, JULES: brilliant French historian: 1798, Aug. 21—1874, Feb. 9; b. Paris; of Huguenot descent. He studied with great success under Villemain and Leclerc, and at the age of 23 became a prof. in the Collège Rollin, where he taught history, philosophy, and the classics. In 1826 he published *Les Tab*

leaux Synchroniques de l'Histoire Moderne, and was named Master of Conferences (*Maître des Conférences*) at the *Ecole Normale*. After the revolution of 1830, he was chosen head of the historic section, intrusted with the care of the archives of the kingdom; was assistant to Guizot at the Sorbonne; and tutor to the Princess Clémentine, daughter of the French king; and published several valuable books—e.g., *Précis de l'Histoire Moderne* (1833, more than 20 editions), *Précis de l'Histoire de France jusqu'à la Révolution Française* (7th ed. 1842), *Mémoires de Luther* (1835), *Origines du Droit Française cherchées dans les Symboles et Formules du Droit Universel* (1837). In 1838 he succeeded Daunou in the Collège de France, and Comte Reinhard in the professorship of moral philosophy. He then plunged into controversy with all the vivacity and impetuosity of his nature. The Jesuits were the grand objects of his dislike; and eloquence, sarcasm, sentiment, and history all were brought to bear upon them with brilliant effect. Three books were the fruits of his polemic: *Des Jésuits*, in conjunction with Edgar Quinet (1843); *Du Prêtre, de la Femme, et de la Famille* (1844); *Du Peuple* (1846). In 1847 appeared vol. 1 of *Histoire de la Révolution*; and it was finished 1853, in 6 vols. When the affair of 1848 broke out, acting more wisely than most of his learned *confrères*, he declined to take active part in political struggles, and quietly pursued his literary avocations. He, however, lost his situation in the archives office after the *coup d'état*, by refusing to take the oath of allegiance to Louis Napoleon. He died at Hyères. Other works of M. were *L'Oiseau* (1856), *L'Insecte* (1857), *L'Amour* (1858) and *La Femme* (1859)—these two were severely and justly criticised; *La Mer* (1861), *La Sorcière* (1862), *La Bible de l'Humanité* (1864, of little value); and *Nos Fils* (1869), a plea for compulsory education. His masterpiece is his *Histoire de France*, finished 1867, now pub. in 19 vols. Its continuations, somewhat inferior, are *Histoire de la Révolution Française* and *Histoire du XIX^{me} Siècle*. M. was brilliant, original, picturesque; but his work shows the bias of strong prejudices, political and theological; and though he was faithful and laborious in historical research, his prejudices, combined with his vivid imagination, have been thought to detract from trustworthiness while adding to brilliancy.

MICHIGAN.

MICHIGAN, *mĭsh'ĭ-gan*: state: one of the United States, 13th in order of admission into the Union, and thus the 26th of the states, 9th in amount of pop. and wealth, 1st in manufacture of lumber, salt, and production of iron ore and copper, 4th in wheat and sheep, 8th in production of pig iron and steel; by census of 1900, 9th in wool clip, 10th in wheat, 4th buckwheat, 10th in oats, 13th in barley, and 18th in Indian corn; name from Indian words *mitchi* and *sawgyegan*, 'lake country.

Location and Area.—M. has a situation, in its two parts (commonly designated as its southern and northern peninsulas), peculiarly within the waters of the great lakes, lat. $41^{\circ} 45'$ — $48^{\circ} 20'$ n., long. $82^{\circ} 25'$ — $90^{\circ} 34'$ w.; bounded in its main part s. by Ind., e. by the w. end of Lake Erie, Detroit river, Lake St. Clair, St. Clair river, and Lake Huron; n. by the upper extremities of lakes Huron and Michigan, and w. by Lake M.; and in its northern part shut in by the waters of Lake Superior on the n., St. Mary's river e., lakes Huron and Michigan s. and s.e., with an extended s.w. boundary on the extreme n.e. part of Wis.: greatest length, n. to s., of main part, 277 m., extreme width 259 m.; length of northern part, e. to w., 318 m., width 30 to 164 m.—this part forming about two-fifths of the state; area of both parts 58,915 sq. m. (37,705,600 acres); elevation of main part 400 to 600 ft. above lake-level; of northern part 400 to 1,100 ft. above Lake Superior; coast-line along navigable lake waters over 1,600 m.; cap. Lansing, since 1847; early cap. Detroit, of terr. from 1805, of state 1835–47. The original terr. of M. organized (1835) as a state was the present s. part only; the n. part was added at admission of state (1837). See *History*.

Topography.—The two parts of the state present a striking contrast in nearly every respect. The s. and main part is generally level, but with a long slope upward from Lake Michigan to a water-shed, the line of which runs n. and s. in the e. part of the state; and with a short slope down to the shores of Lake Huron. The shores of the lakes, on both the e. and the w. sides, are bold, those on the w. especially, often forming bluffs and hills 100 to 300 ft. high; and in the s. occur a considerable number of conical hills, 50 to 200 ft. high. The n. part is in two sections, e. and w. of a line drawn n. and s. through Marquette. The e. section is a plateau which has a long slope upward from its s. border to a water-shed near its n. border, and thence falls rapidly to the shores of Lake Superior. There are many lakes and marshes on this plateau, and a general covering of fine forests, in large part pine and other soft woods, but frequently varied by groves of beech and sugar maple. The w. section of the northern part is rugged, and to a large extent hilly, some of the hills rising 1,000 or 1,200 ft. In the extreme n.w. are the ranges which form the richest copper region known, except Chili. The central range reaches from Keweenaw Point entirely across into Wis., and on either side it is flanked by the Porcupine

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mt. range and the s. copper range. These ranges are well clothed with timber, mostly sugar maple, with very little pine or other soft wood. By the side of the s. copper range lies the iron range of Marquette co. The soil of the northern part of M. is generally sterile; but in the southern and main part, the depth of loam, often mixed with gravel or clay, secures lands of remarkable fertility. The number of lakes and lakelets scattered through all parts of M. is over 5,000, covering 712,864 acres. The rivers are mostly small, but their number is so great as to abundantly water all parts of the state. The Saginaw, Grand, St. Joseph, and some others are to a small extent navigable. The rivers which flow into Lake M. are the St. Joseph, Kalamazoo, Grand, Muskegon, Manistee, Grand Traverse, Manistique, and Escanaba; into Lake Erie, the Huron and Raisin; into Lake Huron, the Saginaw, Au Sable, Thunder Bay, Cheboygan; into Lake Superior, the Ontonagon and Tequame-non. There are groups of islands in the various lake waters—e.g., the Manitou, Fox, and Beaver, in Lake M.; the Bois Blanc, Mackinaw, and Marquette, in the n. part of Lake Huron; Sugar and Nebish islands, in St. Mary's river, and Drummond's Island at its mouth; Grand Island and Isle Royale, in Lake Superior. Isle Royale, with a large number of rocky islets clustered about it, forms an important part of Keweenaw co., 55 m. n.w. from Keweenaw Point, and within 15 m. of the Canada shore: length n.e. to s.w. 45 m.; greatest width 9 m.; area 225 sq. m. It is well clothed with timber, and rises, at points of a central ridge, to 700 ft. The rich copper range of the mainland occurs in it, and there are many relics of ancient mining, such as stone hammers weighing 10 to 30 lbs.; copper knives and other tools which have been hardened by fire; excavations extending continuously more than two m.; underground drains, one of which was cut 60 ft. through rock and covered with large timbers; and many other evidences of skill in mining, following the deposits of sheet-like copper, and making no account of nuggets. On the s. side, where a stream 40 ft. wide has cut a passage through the shore rocks, there are indications of an ancient town, on an elevated slope overlooking the lake, but no human remains. Copper arrowheads have been found on this island, and a rude wooden bowl 3 ft. in diameter. Since the ancient mines were abandoned, at least one generation of the immense trees of the natural forest has grown over them. In all parts of M. lakes are numerous, varying in area from a few acres to several sq. m. The marginal waters of the great lakes contiguous to M. afford navigation for the largest ships and steamers. Navigation around the falls of the St. Mary's, giving passage from Lake Superior to Lake Huron, is effected by means of the St. Mary's ship-canal, at Sault Ste. Marie, originally opened 1855, with two locks, each 70 ft. wide and 350 ft. long between gates, and canal one m. long, giving passage to vessels drawing not over $11\frac{1}{2}$ ft.; the whole improvement

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costing \$999,802. The St. Mary's river, connecting lakes Superior and Huron by a water-way 75 m. long, is properly a series of lakes linked together by narrow and crooked channels. The fall, through the first 50 m. from Lake Superior, is 20·5 ft., and practically it begins 15 m. from Lake Superior, at the falls of St. Mary, where 18 ft. of descent occur in about one m., while for the 35 m. beyond 2·3 ft. of fall occur. The earliest improvement by canal and locks, 1852-55, was provided for by a congressional grant of 750,000 acres of land, and the tonnage through the canal which followed was 100,000 tons the first year, 400,000 five years later, 700,000 ten years later, 1,260,000 in 1875, and 1,750,000 in 1880, at which time the pig-iron production of the United States was drawing one-third of its total supply of ore through this channel, from the Lake Superior mines. Before 1880 the pressure of shipping showed the necessity of a further construction, and the second canal was executed, one of the most important and remarkable engineering works of the time, having a length of 515 ft., width 80 ft., and depth of water over the mitre sill 17 ft. This was opened for business 1881, Sep. 1; and meanwhile extensive improvements were made in the canal above the new lock, and at points in the channel below, and a depth of water obtained nearly equal to that of the lock. The cost of the second work was \$2,000,000, and its value in saving cost of iron-ore transportation was \$800,000 the first year. To complete needed communication, congress 1881, Dec. 29, called on the war dept. for a report as to additional works, and 1882, Jan. 14, Gen. Godfrey Weizel made this, recommending the immediate construction of another lock, the improvement of Hay Lake channel, and the making of a dry-dock on the canal, at an estimated cost of \$4,738,865 for the lock and canal, and \$2,659,115 for Hay Lake channel. The new lock was constructed on the site of that of 1855, 800 ft. long, 100 ft. wide, with 21 ft. of water over the mitre sill. Hydraulic machinery operates the gates and valves of the locks, and a movable dam has been constructed for stopping the flow of water through the canal or locks whenever required by any accident to the locks or the banks below. The work will be continued, to secure throughout the chain of lakes, by deepening the St. Clair flats and the Lime Kilns channel, a depth of 21 ft.; admitting the use of vessels of 2,500 tons burden, carrying coal and other freight from Buffalo, and return cargoes of iron ore and grain. For 1887 the down freight by the canal was 1,749,536 tons, and the up freight 1,745,313 tons, on which the total charges were \$10,075,153, the average per ton per mile being 23-100ths of a cent, while the average railway charge was one cent; demonstrating a saving in one year of ten times the cost to date of the improvements. For the 212 days that the canal was open to navigation 1888, there passed through an aggregate tonnage of 6,200,000, an average of 900,000 a month, which is nearly double the usual monthly tonnage of the Suez

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canal. In 1889 the tonnage was 7,400,000, the St. Mary's canal doing as much in 6 or 7 months as the Suez canal in a year; and representing one-quarter of all the seaport tonnage of the United States. The total valuation of commerce through the canal 1894 was \$143,114,502. In 1895 there passed through the following: passengers 31,656, coal 2,574,362 tons (short), flour 8,902,502 bbl., wheat 46,218,250 bu., other grain 8,328,694, manufactured and pig iron 100,337 tons (short), salt 269,919 bbl., copper 107,452 tons (short), iron ore 8,062,209 tons (short), lumber 740,700,000 ft. B. M., unclassified freight 463,308 tons (short), total freight 15,062,580 tons (short), registered tonnage of vessels 16,806,781 tons (short). Notice was given 1889, July 16, that the canal was prepared for vessels drawing 15 ft. and 3 in. A similar ship-canal, two m. long, completed 1873, connects the waters of Lake Superior with the head of Portage Lake, where this lake cuts through the extreme n.e. part of the great copper range, thus enabling vessels to save the circuitous passage around Keweenaw Point.

Climate.—The relation of M. to the great lakes, and the northern position of two-fifths of the state, give extremes of climate. In the s. part, Lake M. very greatly tempers the w. and n.w. winds, which otherwise would be severe in winter; and through this modifying effect of the lake the s. or main part of M. is made one of the very best fruit-growing regions of the continent. The n. part averages 7° colder than the s. The mean at Lansing, the cap., is 46° 71', for 18 years; at Marquette 38° 3'. The annual rainfall for 18 years, to 1882, was about 31 in., very evenly distributed through the year, but a little more than half falling in the five months May-Oct. The average snowfall, in the centre of the state, is about four ft., but rarely more than 12 in. on the ground at one time. The line n. of which Indian corn will not mature cuts off the n. part of the state, but hardier grains do well, and on the warmer southern lands great quantities of peaches, apples, strawberries, and other varieties of fruit are grown. Vines do well in the principal river-valleys and on the shores of lakes M. and Erie. Wild shrub and vine fruits probably exceed in abundance anything of the kind elsewhere. Cranberries are so plentiful in the marshes as often to exclude other growths. There are wild grapes of several varieties, gooseberries of two sorts, currants, raspberries, high and low blackberries, blueberries, whortleberries, bilberries, mayberries, hawthorn-berries, mandrakes, etc., in great profusion. Wild nuts are very abundant—e.g., black walnut, hickory, hazel, butternut, etc.

Geology.—The great geological basin which extends from London, Can., to Madison, Wis., has its central ground in M., on the water-shed from which the streams flow e. and w. to lakes Huron and Michigan. The whole of this, from Saginaw Bay on Lake Huron to Jackson in the s., is a coal-field, embracing about 8,000 sq. m., but at a level such that the bituminous beds

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cannot be worked without pumping out the water; and as the coal is not pure enough for use in smelting or to make gas, it is practically untouched—the coals of O. and Penn. being employed for smelting the ores of the Lake Superior mines. Going out from the central coal-field of the state, either e. or w., we cross the outcropping edges of successively older and older strata: first the carboniferous limestone; then slates and sandstones, which appear along the shores of Lakes Huron and M.; and then other limestones and associated strata, which appear in the n. at Mackinaw, and over into e. Wis., and in n. Ind. and O. The Lake Huron shores supply excellent grindstones near Thunder Bay; and near Saginaw Bay salt (brine) is reached by boring. In the n. part of M. the formations are the lower Silurian, underlying the plateau of the e. section; then the copper-bearing rocks, in connection with which silver is frequently found; then the Huronian formation, a series of extensively folded beds, among which are intercalated the extremely rich and extensive beds of magnetic, specular, and other iron ores, the yield of which is unsurpassed in quality, and is equalled in quantity by no state except Penn. The aggregate output of copper ore, from the opening of the mines in 1845 to 77, was 289,188 tons, of the value of \$116,928,280. The total iron product for 27 years, 1856–82, was 20,584,931 tons, valued at \$164,830,526. In 1889 the production of iron ore was 5,856,169 long tons, valued at \$15,800,521, the production of pig-iron (1892) was 184,421 long tons, (1893) 117,538 tons, (1896) 158,484 tons. The shipments of iron ore in 1896 were: from the Marquette Range 2,605,152 long tons, Gogebic Range 1,799,884 long tons. The output of copper (1889) was 2,433,733 tons of ore and 87,455,675 lbs. of fine copper. The yield of the salt wells of M. dates from 1860, and to the close of 1877 the aggregate production was 11,960,938 bbl. The total product of 1878 was 1,885,884 bbl.; (1879) 2,058,040; (1880) 2,676,588; (1881) 2,750,299. The Saginaw co. wells reached the salt deposit at the average depth of 900 ft., but in Manistee co. the boring was to the depth of 1,964 ft., where 32 ft. of solid salt rock were found. In 1882 were produced 3,204,921 bbl., of which the average price was 70 cts. a bl. The output (1884) was 3,252,175 bbl. The report for 1887 was 125 firms, in 19 cos. of the state, engaged in salt production; operating 118 steam and 24 pan blocks, with an annual producing capacity of 5,265,000 bbl. The product (1887) was 4,260,012 bbl., and the total product of the state to that date 41,322,895 bbl. The price per bl. had fallen to 60 cts. from \$1.80 in 1869. For 1889 the output was 4,334,889 bbl.; capital invested in salt-producing plants \$4,700,000; men employed 3,600; number of wells 254, of which 26 were from rock-salt and 228 from sand-rock; average per well, from rock-salt wells 67,118 bbl.; from sand-rock wells 11,358 bbl.—Gold and silver are among the products of the mineral region of M., the gold produced 1888 being of the value of \$32,338, and the silver \$2,592.

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The same year's product of stucco was 170,145 bbl.; of land-plaster 28,794 tons. An interesting feature of the geology of M. occurs on the n.e. border, about 30 m. w. of the e. end of Lake Superior. The bold shore of the lake, for a distance of 12 or 15 m., is of sandstone, in a variety of colors, and rising 200 to 300 ft. above the waters, the action of which has carved and polished the overhanging stone into arches, pillars, cavern temples, or towering castles, which present a wonderful spectacle seen from a steamer on the lake. Along this shore, known as the 'Pictured Rocks,' are cascades which shoot so far over the high precipices that a vessel may pass between the waterfalls and the wall of rock.

Zoology.—Among animals native to M. in its original state are: the shy voracious wolverine; herds of the black bear; three kinds of wolves, the gray, the large black, and the little prairie; the elk and moose; the red deer and the reindeer; the lynx, wild cat, and panther; different varieties of the fox, including an arctic fox perfectly snow-white, except the tip of the nose and a few black hairs in the ear; the martin, gopher, squirrel, rabbit, raccoon, porcupine, opossum, weasel, skunk, polecat, marmot or woodchuck, hare; and in the smaller rivers and lakes, the beaver, otter, musk-rat, mink, etc. Of birds, there are the eagle, buzzard, crow, heron, owl, great white owl; the wild goose, brant, duck, crane, swan, loon, plover, gull; the partridge, white partridge, quail, woodcock, grouse or prairie-hen, wild turkey, pigeon, snipe; and very many varieties of field and forest birds, including a very large number of birds of plumage and song, whose winter home is much further south. Bees are found wild in great numbers. The extent of forests in M. is 14,000,000 acres. All the n. part is well timbered with white pine, spruce, hemlock, birch, oak, ash, hickory, maple, aspen, and elm. The s. or main part of the state is largely made up of prairie with oak openings, but extensive forests occur, also, in which the more important trees are oak, hickory, walnut, ash, sugar maple, elm, beech, sycamore, locust, linden, basswood, spruce, hemlock, pine, tamarack, cypress, cedar, chestnut, and cherry. In very large part, the early settlements involved clearing off heavy forest growth.

Agriculture.—In excellence, amount, and variety of agricultural products—grain, vegetables, fruit, pork, butter, milk, cheese, sheep, and wool—M. has long stood in the front rank of agricultural states. The census of 1870 made it 10th in value of all products, with 98,786 farms, covering 10,019,142 acres, of which 5,096,939 were improved; with cash value of land, implements, and machinery, \$411,951,557; and value of all products, including stock, \$146,478,101. In 1889 (census 1890) the number of farms was 172,344, with a total acreage of 14,785,636 acres, or 86 acres per farm. Of this 9,865,350 acres were improved and 4,920,286 unimproved. The value of land, fences, and buildings was \$556,190,670; implements and machinery \$22,182,600; live stock on hand, June 1, \$69,564,985; farm products of the year \$83,651,390.

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Among these products were; barley 2,522,376 bu., buckwheat 811,977 bu., indian corn 28,785,579 bu., oats 36,961,193 bu., rye 2,101,713 bu., wheat 24,771,171 bu., hay 2,385,155 tons, Irish potatoes 15,651,833, wool 12,378,318 lbs., milk 224,537,488 gals., butter 50,197,481 lbs., cheese 328,682 lbs. In 1895 M. had 994,090 acres in corn producing 33,600,242 bu., valued at \$10,752,077; wheat, 1,154,379 acres, 15,237,803 bu., value \$9,142,682; oats, 973,439 acres, 23,265,192 bu., value \$5,350,994, etc. In 1900 the farms numbered 203,261, comprised 17,561,698 acres, and were valued, with improvements, machinery and stock, at \$690,355,734.

Manufactures.—M. had (1890) 12,127 manufacturing establishments, employing 163,941 hands, using \$263,412,240 capital, paying \$66,347,798 in wages, requiring \$154,521,918 in raw materials, and producing \$277,896,706 of products. The leading industries were: lumber, saw-mill product, establishments 1,918, employees 46,592, wages \$14,677,436, materials \$45,605,543, products \$73,484,306; lumber, planing-mill products, establishments 230, employees 5,199, wages \$2,345,560, materials \$6,151,535, products \$10,007,603; timber products not manufactured at mills, establishments 206, employees 10,292, wages \$2,722,172, materials \$3,812,831, products \$9,637,663; flour and grist-mill products, establishments 544, employees 2,425, wages \$1,093,861, materials \$19,462,779, products \$22,778,829; foundry and machine-shop products, establishments 260, employees 8,560, wages \$4,813,012, materials \$5,491,366, products \$13,363,030; furniture, establishments 223, employees 8,487, wages \$3,987,333, materials \$4,119,872, products \$10,390,619; clothing, men's, establishments 445, employees 3,424, wages \$1,700,813, materials \$2,618,664, products \$5,566,652; iron and steel, establishments 19, employees 1,509, wages \$826,117, materials \$4,132,991, products \$5,829,843; ship-building, establishments 62, employees 2,284, wages \$1,267,102, materials \$2,300,290, products \$4,710,108; tobacco, chewing, smoking, and snuff, establishments 5, employees 1,352, wages \$408,525, materials \$2,383,032, products \$4,742,412; tobacco, cigars and cigarettes, establishments 373, employees 2,830, wages \$1,300,359, materials \$1,340,477, products \$3,512,603; agricultural implements, establishments 65, employees 1,847, materials \$992,708, products \$3,955,306; chemicals, establishments 64, employees 1,531, wages \$720,841, materials \$1,219,045, products \$3,380,388; boots and shoes, factory product, establishments 12, employees 1,371, wages \$582,132, materials \$1,209,387; malt liquors, establishments 78, employees 839, wages \$588,109, materials \$998,128, products \$2,979,258; paper, establishments 21, employees 938, wages \$451,483, materials \$1,451,698, products \$2,292,984; salt, establishments 81, employees 1,629, wages \$578,614, materials \$784,012, products \$2,046,975. The lumber cut of 1879 was greatly in excess of any previous year. There were 64 mills, at 8 points on Saginaw river, employing over 4,000 men; on the Lake Huron shore the business was larger still; and the w. shore mills, interior, and others, added another third. The aggregate cut was 2,289,066,855 ft.

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of lumber, 139,357,600 laths, and 685,619,150 shingles. There were 81,180,000 logs in boom. The forest reviewers reported that the pine regions were being rapidly denuded, and that large areas were already worked out. For 1880 the aggregate cut of lumber was 3,398,187,227 ft., besides 2,988,600,000 shingles, 428,445,000 laths, 36,000,000 staves, and 3,330,000 sets headings for barrels, cut in the lower part of the state; and in the upper part 106,482,000 shingles and 34,266,000 laths. The amount of timber still standing was estimated 20,000,000,000 ft. of white pine between Lakes M. and Huron, distributed over 6,500,000 acres. Of hard wood there were estimated 575,500,000 cords, distributed over some 20,000,000 acres of the inter-lake part of the state. In the n. part (or upper peninsula) there were estimated 6,000,000,000 ft. of white pine not yet cut, and 124,500,000 cords of hard wood, distributed over about 10,000,000 acres. For 1882 the cut of pine lumber of M. aggregated 3,978,801,282 ft., out of the total for the northwest of 7,513,806,191 ft. In 1900 M. had 16,807 manufac. establishments, with \$284,097,133 capital, employing 162,355 persons, and had products valued at \$356,944,082.

Commerce.—The customs districts and ports of entry for M. are Detroit, Huron (at Port Huron), Michigan (at Grand Haven), and Superior (at Marquette). The shipment of goods without appraisement to interior ports, from the port of first arrival, may take place under the U. S. act of 1870, July 14, and there has been some dispatching of vessels direct to Europe from Detroit; but the foreign commerce of M. is mostly with Canada. The exports consist chiefly of iron ore, copper, salt, building stone, lumber, furniture, carriages and railroad cars, grain, flour, beef, fish, hogs, pork, butter, peaches, apples, dried fruit, and maple sugar. The value of imports and exports for the year ending 1896, June 30, was: at Detroit, imports \$1,609,823, domestic exports \$2,215,045, foreign exports \$1,472,185, total \$3,687,230; at Port Huron, imports \$2,967,827, domestic exports \$6,927,038, foreign exports \$31,576, total \$6,958,614; Grand Haven, imports \$219,549, domestic exports \$87,540; at Marquette, imports \$248,185, domestic exports \$5,262,693, foreign exports \$4,200, total \$5,266,893. In 1896 the total number of ships enrolled was 1,181, of 477,713·3 tons; of these 508 were sailing-vessels, 151,436·64 tons; 665 steam, 322,429·11 tons; and 8 barges, 3,847·55 tons. In 1895, June 30, the number and tonnage of the vessels of all kinds owned at the four ports were: Port Huron, 448 vessels, 178,946·07 tons; Detroit, 288 vessels, 163,542·08 tons; Marquette, 168 vessels, 74,650·15 tons; Grand Haven, 282 vessels, 33,984·57 tons. From the internal revenue districts the collections were: (1896) \$2,150,144·38, (1895) \$2,173,888·01, (1894) \$2,127,647·28, (1893) \$2,346,427·77, (1890) \$2,192,290·50, (1886) \$1,671,994·45. The amount of beer produced was: (1896) 722,244 bbl. (31 gals.), (1895) 659,470, (1894) 653,480, (1893) 725,215, (1892) 650,823. The imports of merchandise at the ports of Detroit Huron, rGand Rapids, Michigan and Superior, during the year 1902 aggregated in value \$8,774,188, and the exports \$37,031,377.

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Railroads.—In 1873 M. had 3,253 m. of railroads, with 1,322 locomotives, 30,675 cars, 9,000,000 passengers carried, and gross earnings \$35,000,000. In 1875 the legislature set apart 1,326,965 acres of public land, to be applied to securing railway communication between the Straits of Mackinaw and Marquette, for trade with the rich mineral region and to promote commerce with the grain-producing region beyond Duluth. The Detroit Mackinaw and Marquette railroad co. received these lands and built the desired road. The total mileage within the state (1878) was 3,539, under 40 companies, representing capital about \$187,000,000. To 1881, Dec. 31, the companies were 54, with 4,252 m. in the state; (1884) companies 60, mileage in the state 5,121; (1885) mileage 5,509, (1890) 7,108, (1895) 7,549, (1896) 7,666. In 1895 the total capital stock was \$32,703,400, funded debt \$119,320, total investment \$246,249,946; gross earnings, from passengers \$8,584,001, freight \$20,005,287, all sources \$30,287,618; net earnings \$6,559,292, interest on bonds \$6,353,527, dividends on stocks \$1,251,339. The Railroad Act of 1889 reduces charges for passenger fares from 4 to 3 cts. a m. on 5 m. or less, and over 5 m. fixes a 2-cts.-a-m. fare if road has gross earnings of \$3,000 a m.; 2½ cts. if gross earnings are between \$2,000 and \$3,000 a m.; and at 3 cts. a m. if gross earnings are under \$2,000 a m. The previous rate for all these cases was 3 cts. a m. Higher rates may be charged in the upper peninsula. The law requires the companies to have for sale at every station 1,000-mile tickets for \$20 in the lower, and \$25 in the upper peninsula, to be used by any member of purchaser's family.

Religion.—In 1890 M. had 4,798 church organizations, 3,761 church buildings of 1,097,069 seating capacity, valued at \$18,682,971, and 569,504 members, or 27·20 per cent. of the total pop. The leading denominations were: Rom. Cath., 406 organizations, 222,261 members; Meth. Epis. 1,085 organizations, 86,958 members; Bapt., 523 organizations, 39,580 members; Congl. 331 organizations, 24,582 members; Luth., 380 organizations, 62,897 members; Presbyterians, 236 organizations, 25,088 members; Prot-Episc., 191 organizations, 18,136 members; German Evang., 50 organizations, 10,926 members; Reformed, 106 organizations, 15,404 members.

Education.—The report of the public schools for 1894 showed a school pop. (5-20 years) of 696,234; school enrollment 468,979 or 75·84 per cent. of the school pop.; average daily attendance 286,077, average number of school days 156, aggregate attendance 49,237,188 days; teachers employed 3,479, schoolhouses 7,769, value \$16,584,399, school expenditure \$6,092,090, or \$2·73 per capita. The sources of the school revenue of M. are: (1) interest on permanent fund produced by sale of lands originally granted by the state constitution (1837) for this purpose; (2) a one-mill tax levied on each township by the supervisor; (3) local or district taxes levied by vote of the people, for building or other special purposes; (4) the

dog-tax, less \$100 and any sums paid for injury by dogs to stock; (5) fines for breaches of the penal laws, apportioned to the townships by the county treasurer. The lands devoted to school uses by the grant of 'section 16,' in every township, were 1,077,209 acres. On the sum realized by sales of these lands the state pays 7 per cent. interest, and this is apportioned by the supt. of public instruction to the counties, in proportion to the number of children in districts properly maintaining schools. It cannot be used for any purpose except to pay the wages of teachers. The township tax is apportioned to the districts paying it, if they are properly maintaining schools, and it can be used only for school and library purposes. To all children of school age, 5-20, the public schools are free, for a full course from the lowest primary to complete preparation in the high schools for entrance to the university. A small fee was formerly charged for advanced high-school studies, but this has been abolished. It is required by the state constitution that a free school be in session at least three months in every district; not less than five months for districts with a school population of over 30 and under 800; and with over 800, not less than nine months. Any district with over 100 of school age may, by a two-thirds vote, establish a special board of six, authorized to arrange for schools graded as primary, grammar, and high schools, with, usually, a four-years' course in each of the three grades. Urgent efforts are being made to change from the school-district plan to a system making the township the unit of organization and control, and to secure the text-books both uniform and at state expense.

The earliest legislative effort of M. for schools was an act of 1809, under the territorial govt., with a pop. less than 5,000. The growth of the system to 1888 had given over 7,000 schools, educating 425,000 children, and four state seats of higher instruction, enrolling over 3,000 students—more than half of them in the state univ. In Aug., 1817, the chief-justice of the terr., Augustus B. Woodward, drew up and secured the adoption (by the legislative council) of the original act to establish a Univ. of M., Gov. Cass heartily co-operating, and two clergymen acting as chief promoters—the Rev. John Monteith, Presb., and Father Richard, Rom. Cath.; the former becoming pres., and the latter his associate in instruction. Gov. Cass secured, at a great conference with the Indian chiefs (Tontagini and others), the cession of three sections of land to 'the coll. at Detroit.' The basis of the new univ. was that of state control, non-sectarian character, and instruction as nearly free as possible—15 per cent. to be added to the taxes in the terr. to support a univ. The act of organization was revised 1821, and the plan made to cover 'colleges, academies, and schools' below the univ. proper. In 1826 congress made a grant of land, including two entire townships of 72 sections, and Gov. Cass urged the legislative council to establish free schools supported by

taxation. The larger development came with the organization of M. as a state, 1835-37, when Gen. Cary secured from congress land grants directly to the state as trustee, and the Rev. John D. Pierce was made supt. of public instruction and reported the broad system which has been mainly carried out. A legislative act of 1837, Mar. 18, gave the University of M. its present form—opened 1842, Sep. 20, with five students. The univ. is under the care of a board of eight regents, chosen for a term of eight years by popular vote, two going out every two years. See MICHIGAN, UNIVERSITY OF.

The state normal school, with a model school attached, was established by legislation 1849, Mar. 28, and opened at Ypsilanti, in the s.e. part of the state, 1853, April, with a two-years' course of study for teachers of common schools, a three-years' course extending to higher English studies, and a four-years' course to cover ancient and modern languages. In 1879 the school had graduated 800; in 1888 it enrolled 948 students. The state had disbursed to it (to 1879) \$448,980. The state agricultural coll. at Lansing was established by act of 1855, Feb. 12, opened 1857, May, and 1879 had been built up into a strong institution by state expenditure of \$623,546. Under the act of congress, 1862, 240,000 acres of public land were made the basis of a fund for it, which amounted 1882 to \$224,868, with lands still to be sold of the value of \$677,345, giving a probable fund of over \$900,000. In addition to the interest of the fund, and tuition fees paid by non-residents, \$20 a year, the state makes an appropriation annually from the proceeds of taxation. Students take a course of four years in sciences, English studies, modern languages, and civil engineering, with labor on the coll. farm of 676 acres, and receive the degree B.Sc. The number of students enrolled 1888 was 312. The special importance of the mining interests of M. occasioned the establishment of the M. mining school at Houghton, opened 1886, students (1895) 94; profs. 13.

The 'state public school for dependent and neglected children' was a pioneer of its kind, its object being the education of children of the pauper class. It was provided for by legislation 1871, April 17, and opened 1874, May 22, at Coldwater, near the centre of the s. border of the state. Children from 3 to 14 are taken, and after careful education are placed in permanent homes. During 1888 there were received 194, and as many indentured to homes. Up to this year, 2,512 children had been thus cared for. The cost to the state of this school, 1886, was \$91,200. The colleges of M. not under state control, and either organized or reorganized at the dates given, are Hillsdale (at Hillsdale, reorganized 1855, Freewill Bapt.), Kalamazoo (at Kalamazoo, reorganized 1855, Bapt.), Adrian (at Adrian, 1859, Meth. Prot.), Olivet (at Olivet, reorganized 1859, Congl. and Presb.), Albion (at Albion, reorganized 1860, Meth. Episc.), and Hope (at Holland, 1866, Reformed); besides

academies, seminaries for young ladies, boarding and other private schools.

The following are other state institutions, with the number of inmates, cost per annum, and volumes in library 1894-5: Michigan School for the Deaf, at Flint, 275 pupils, \$74,287 expenses, 4,017 volumes; Michigan School for the Blind, at Lansing, 95 pupils, \$21,000 expenses, 3,160 vols.; Michigan Home for the Feeble-minded and Epileptics, Lapeer, \$75,000 expenses; State Industrial Home for Girls, Adrian, 346 pupils, \$37,675 expenses; Preservation Class of the House of the Good Shepherd, Detroit, 200 pupils, \$12,500 expenses; State House of Correction and Reformatory, Ionia, 165 pupils, \$45,243 expenses. The soldiers' home, which had been previously scattered among boarding-houses, was fixed 1886, Dec. 30, in a building (cost \$100,000) near Grand Rapids, on a beautiful site given by citizens of that city at a cost of \$16,000. M. had (1902) 790 newspapers and periodicals—78 daily, 21 semi-weekly, 585 weekly, 1 bi-weekly, 6 semi-monthly, 85 monthly, 4 bi-monthly and 5 quarterly. The circulation is above 5,000 of 4 daily and 4 Sunday papers, of 12 weekly, 8 monthly, and 1 quarterly.

Illiteracy.—Person 10 years of age and over enumerated (1890) 1,619,035; of these 95,914, or 5·9 per cent., were illiterates; male population 10 years of age and over 851,163, illiterates 51,522, or 6·1 per cent.; female population 10 years of age and upwards 767,872, illiterates 44,392, or 5·8 per cent.; total whites 10 years of age and over 1,602,474, illiterates 91,076, or 5·7 per cent.; native whites 10 years of age and over, total 1,086,481, illiterates 27,016, or 2·5 per cent.; foreign whites 10 years of age and over, total 515,993, illiterates 64,060, or 12·4 per cent.; colored population 10 years of age and over, total 16,561, illiterates 4,838, or 29·2 per cent.

Finances and Banking.—The taxable property of M. assessed 1850 was \$59,787,255; (1860) \$257,163,983; (1866) \$307,965,843; (1876) \$374,841,031; (1886) \$810,000,000. In 1890 the estimated true value of real estate, with the improvements thereon, was \$1,149,290,454, stock on farms \$91,747,585, mines and quarries \$77,608,518, gold and silver coin and bullion \$34,418,789, mill machinery and products \$86,490,821, railroads with equipment \$375,484,286, telegraphs, telephones, shipping and canals \$38,723,391, miscellaneous \$241,252,428, total \$2,095,016,272, or \$1,001 per capita. The assessed valuation was on real estate \$739,690,151, personal \$158,465,381, total \$898,155,532. The ad valorem taxation amounted to \$14,477,767, or \$6·91 per capita and \$1·61 on each \$100 of assessed valuation. The total debt less sinking fund was \$16,941,928, or \$8·09 per capita; state debt \$5,308,294, county \$1,257,698, municipal \$8,510,439, school district \$1,865,497; annual interest charge \$684,145, or 5·65 per cent. In 1896 the assessed valuation of real estate was \$805,553,976, personal property \$140,455,965, total valuation \$946,009,941. On July 1, 1897, the only bonded debt of the state was \$19,000 of 'past due part paid \$5,000,000 loan bonds,' which have

never been presented and bear no interest. The trust-fund debt was \$5,766,703. The equalized property valuation in 1901 was \$1,578,100,000; total assessed valuation (1902) \$1,418,251,858, and the State tax rate \$2.431 per \$1,000. Oct. 31, 1902, M. had 44 nat. banks, with \$5,300,000 cap. stock; 244 state banks, with \$12,834,683 cap., and 249 private banks, with \$2,631,724 capital.

Under the state banking law of 1858, amended 1873, M. had 80 incorporated banks at the going into effect, 1889, Jan. 7, of a general banking law. 1889, Jan. 7—Dec. 31, the bank commissioner incorporated 13 new banks, and one loan, trust, and security company, making of banks in M. (1890) 93 state, 113 national, and 3 loan, trust, and security companies. The capital in the national banks was \$15,674,600, deposits \$35,217,989; capital in 90 state banks making returns \$7,254,559, deposits, commercial and savings, \$35,051,783. In 59 state banks having savings deposits, 97,803 depositors had \$23,669,030. The balances at the clearing houses for M. (1889) were, at Detroit, 16 banks, \$29,527,432; at Grand Rapids, 7 banks, \$32,897,363. The exchanges for the year ending 1902, Sept. 30, at the U. S. clearing houses at Grand Rapids, Kalamazoo and Detroit were \$681,302,293, an increase over the preceding year of \$83,439,942.

History.—French explorers first visited the site of Detroit 1610, and the falls of St. Mary 1641. Marquette made the first settlement at Sault Ste. Marie 1668; Fort Mackinac was settled 1671; and 1701 Detroit was founded, and, in presence of Indian chiefs of the northwest, formal possession was taken for Louis XIV. of all territory from the lakes to the South Sea, and a cedar post erected to mark the event. Wolfe's victory at Quebec 1759, Sep. 13–18, led to surrender of Detroit and other n.w. posts 1760. French rule finally yielded to British 1763, and Pontiac's conspiracy and exterminating war followed this change. Nominal American possession began 1783, at the close of the Revolution, but was not actual until 1796, when Detroit was first occupied by an American force, M. having been from 1787 part of the n.w. terr., of which Gen. St. Clair was the first gov. From 1802 it was a part of Indiana terr. (cap. at Vincennes); 1805 the terr. of M. was created, with Hull as gov., who, as American commander in the war of 1812, surrendered it to British control 1812, Aug. 16. Col. McArthur recovered possession 1813, Sep. 29, and Col. Lewis Cass was made gov. for a period of extraordinary service, 1813–31, in dealing with Indians, securing surveys, opening roads, and preparing the foundations of a state. Govt. surveyors to locate bounty lands for soldiers in the war of 1812 reported against M. lands as swampy and sterile, and turned immigration away. In 1817 Chippewas and Wyandottes ceded 4,000,000 acres of what is now in n. O. and Ind. and s. M., giving M. settlements their first connection with those of O. and

Ind. On the admission of Ill. into the Union, 1818, all the terr. lying n. of that state and Ind. was annexed to the terr. of M., and 1819 congress authorized this enlarged terr. to elect one delegate to Washington, with the right to speak, but not to vote. The Chippewas, 1819, ceded by treaty of Saginaw 6,000 acres of land; 1821, by treaty of Chicago, Chippewa, Ottawa, and Pottawattamie tribes ceded the land next w. of the Saginaw cession and s. of Grand river, and 1823 the Delawares gave up all that in the valley of the Muskingum. 1820, May 6, Cass and Schoolcraft set off at head of an exploring party, which made a journey of 5,000 m. in the n.w., as far as upper Red Cedar Lake. In 1823 congress gave M. terr. the privilege of a legislative council of 9 appointed by the pres. out of 18 elected by the people; 1834 a census showed a pop. (87,278) entitled to form a state; 1835, Jan., legislative council authorized a convention to form a constitution; this body was elected Apr., and met at Detroit May; and Oct. the constitution was adopted, and state officers and legislature elected. Congress refused application for admission into the Union, except on conditions which a convention in M., 1836, Sep. 2, refused to submit to, a dispute existing as to the right of M. to extend to a line drawn due e. from the s. point of Lake M., and congress asking M. to yield the Toledo strip n. of this line, and take instead of it the present upper peninsula. A self-originated Jackson party convention assumed to accept this 1836, Dec. 6, and congress recognized this action and admitted the state 1837, Jan. 26, on the same day as Arkansas. A new constitution in 1850 was the final basis on which has been erected during 40 years one of the most remarkable of the great examples of state growth ever known. In the war of 1860-64, with a pop. 1864 of 805,379, M. had sent 90,747 men to the field, and the state, counties, cities, and towns had paid for war purposes \$16,548,993, besides both state and private benefactions to disabled soldiers.

Government.—The state administration consists of 9 state officers elected by popular vote to serve two years: gov., lieut.gov., sec. of state, treasurer, auditor-gen., atty.gen., supt. public instruction, commissioner of state land office, and member of state board of education. Legislative acts have provided also for one commissioner each of railroads, insurance, immigration, mineral statistics, labor, swamp land, and banks; state boards of health, of fish commissioners, and of commissioners of state institutions of correction and charity; a salt inspector and an oil inspector. The state constitution, framed 1850, and put in place of that framed 1835 (recognized by congress 1837), has remained in force, with amendments adopted from time to time. New revised constitutions framed by (1) convention of 1867, May 15—Aug. 22, and voted on 1868, Apr., and (2) by legislative commission of 18 (1873), amended and submitted by legislature 1874, and voted on Nov. 3, were

not adopted by popular vote; and the question of another attempt at revision submitted to the people 1881, and voted on 1882, Nov. 7, was decided negatively; and woman suffrage was negatived by a special vote 135,957 nays to 40,077 yeas. By act of legislature 1889, the people will vote 1890, Nov., whether to have a convention 1891, Dec., to revise the constitution. The state legislature consists of a house of 100 representatives and a senate of 32 members. Its sessions are held biennially in odd years. The apportionment of members of the lower house is made to the cos. or representative districts after each new census, state or United States (as in 1884 and 90). Prohibition of aid to religious sects, of giving state credit to any person, corporation, or association, or of granting licenses to sell ardent spirits or intoxicating liquors, was embodied in the constitution until 1876, Nov., when an amendment striking out the liquor-license prohibition was carried by a majority of 8,072 votes. 1887, April, an amendment to restore prohibition was voted down by a majority of 5,645. The judiciary of M. consists of a supreme court, circuit courts, probate courts, justices of the peace, court of mediation and arbitration, and municipal courts—all chosen by popular vote: the supreme court, a chief justice and four associates (three, until a fourth was provided for by amendment adopted 1887) chosen for 10 years (one retiring every two years), with the usual appellate jurisdiction, and holding four terms annually at the cap., Lansing (opening Jan., April, June, and Oct., Tuesday after first Monday); 30 circuit judges elected by the people from 30 judicial districts, into which the state is divided [8 at adoption of constitution, 1850, increased by legislative acts from time to time, had become (1869) 16; (1875) 20; (1879) 24; (1881) 28; (1889) 30], to serve for six years, courts being held in each co., with general original jurisdiction, civil and criminal, and on appeal from lower courts; probate judges, one chosen in each co. by popular vote, for the usual probate service, for terms of four years; and four justices of the peace in each township, elected to serve four years, with prescribed criminal jurisdiction, and civil in cases involving not over \$300. The suffrage belongs to all males more than 21 years of age, residents of the state for three months and in the place of voting ten days, including civilized Indians not of tribal connection, and foreigners naturalized as U. S. citizens. Elections are held in even years on the Tuesday after the first Monday of Nov. Every 16 years, from 1866, the question of a new constitution must be submitted to popular vote. The share of M. in the U. S. govt. is 11 members of the house of representatives at Washington, and two senators—giving 13 votes in the electoral coll. for choice of pres. and vice-pres.

M. has had govs.: 21 under French rule of entire northwest 1622–1763; 5 under British rule 1763–96; and as part of n.w. terr. 1796–1800 Arthur St. Clair; as part

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of Indiana terr. 1800-05 William Henry Harrison; as M. terr. 1805-13 William Hull; 1813-31 Lewis Cass; 1831-34 George B. Porter; 1834-5 Stevens T. Mason; and as state, not in the Union 1835-37, admitted to Union 1837-40, Stevens T. Mason; 1840-1 William Woodbridge; 1841-2 (acting) J. Wright Gordon; 1843-45 John S. Barry; 1846-7 Alpheus Felch; 1847 (acting) William L. Greenly; 1848-9 Epaphroditus Ransom; 1850-1 John S. Barry (2d term); 1852-3 Robert McClelland; 1853-4 (acting) Andrew Parsons; 1855-58 Kinsley S. Bingham; 1859-60 Moses Wisner; 1861-64 ('war gov.') Austin Blair; 1865-68 Henry H. Crapo; 1869-72 Henry P. Baldwin; 1873-76 John J. Bagley; 1877-80 Charles M. Croswell; 1881-2 David H. Jerome; 1883-4 Josiah W. Begole; 1885-86 Russell A. Alger; 1887-90 Cyrus G. Luce; 1890-93 Edwin B. Winans; 1893-97 J. T. Rich; 1897-1901 H. S. Pingree; 1901 A. T. Bliss.

Counties, Cities and Towns.—M. is divided into 83 counties. In 1880 the most populous counties were: Wayne 166,444; Kent 73,253; Saginaw 59,095; Lenawee 48,343; St. Clair 46,197; Jackson 42,031; Washtenaw 41,848; Oakland 41,537; Genesee 39,220; Calhoun 38,452; Bay 38,081; Allegan 37,815; Kalamazoo 34,342; Ionia 33,872; Ingham 33,676; Monroe 33,624; Montcalm 33,148; Ottawa 33,126; and Macomb 31,627; cities and towns: Detroit 116,340; Grand Rapids 32,016; Saginaw 29,541; Bay City 20,693; Jackson 16,105; Kalamazoo 11,937; Muskegon 11,262; Port Huron 8,883; Flint 8,409; and Lansing 8,319. In 1890 the leading counties were: Wayne 257,114; Kent 109,922; Saginaw 82,273; Bay 56,412; St. Clair 52,105; Lenawee 48,448; Jackson 45,031; Calhoun 43,501; Washtenaw 42,210; Berrien 41,285; Oakland 41,245; Muskegon 40,013; Marquette 39,521; Genesee 39,430; Kalamazoo 39,273; Allegan 38,961; Ingham 37,666; Houghton 35,389; Ottawa 35,358; Menominee 33,639; Ionia 32,801; Montcalm 32,637; Sanilac 32,589; Tuscola 32,508; Monroe 32,337; Eaton 32,094; and Macomb 31,813; cities and towns: Detroit 205,876; Grand Rapids 60,278; Saginaw 46,322; Bay City 27,839; Muskegon 22,702; Jackson 20,798; Kalamazoo 17,853; Port Huron 13,543; Battle Creek 13,197; Lansing 13,102; West Bay City 12,981; Manistee 12,812; Alpena 11,283; Ishpeming 11,197; and Menominee 10,630.

Politics.—State, congressional, presidential, and probate judge elections are held on the Tuesday after the first Monday in Nov. Elections of circuit and supreme court judges, and of regents of the univ., occur early in April, and voting on amendments to the constitution may take place as ordered, either in Nov. or in April. The state govt. (1903) is republican, with a party maj. in the legislature of 84 on joint ballot—30 in the senate, 80 in the house. Representation of the state in congress is by 12 republican representatives in the house, and 2 republican senators. The state has voted for pres. and vice-pres.: 1837 Martin Van Buren and Richard M. Johnson 3; 1840 William Henry Harrison and John Tyler; 1844

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James K. Polk and George M. Dallas 5; 1848 Lewis Cass and William O. Butler; 1852 Franklin Pierce and William R. King 6; 1856 James Buchanan and John C. Breckinridge; 1860 Abraham Lincoln and Hannibal Hamlin; 1864 Abraham Lincoln and Andrew Johnson 8; 1868 Ulysses S. Grant and Schuyler Colfax; 1872 Ulysses S. Grant and Henry Wilson 11; 1876 Rutherford B. Hayes and William A. Wheeler; 1880 James A. Garfield and Chester A. Arthur; 1884 James G. Blaine and John A. Logan 13; 1888 Benjamin Harrison and Levi P. Morton 13; 1892 Grover Cleveland 5 and Benjamin Harrison 9, total 14; 1896 William McKinley and Garret A. Hobart 14; 1900, William McKinley and Theodore Roosevelt.

Population.—Terr. (1800) 551; (1810) 4,762; (1815) about 5,000 whites and 40,000 Indians; (1820) 8,765; (1830) 31,639; state (1835-37) 174,647; (1840) 212,267; (1850) 397,654; (1860) 749,113; (1870) 1,167,282 (including Chinese 1, Japanese 1, and Indians 4,026); (1880) 1,636,937 (including colored 15,100, Chinese 28, Indians civilized or taxed 7,249); (1890) 2,093,889 (including 2,072,884 white, 21,005 colored, native born 1,550,009, foreign born 543,880, foreign parentage 1,145,827, in cities of 8,000 and over 546,095, total males 1,901,780, females 1,002,109; (1900) 2,420,982.

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MICHIGAN, LAKE: one of the five great fresh-water lakes, the only one wholly in the United States: having Mich. on the n. and e., Wis. and Ill. on the w., and Ind. on the s.; 345 m. extreme length, 84 m. extreme breadth; average breadth 70 m.; 22,400 sq. m.; mean depth 1,000 ft. It is of about the same area as Lake Huron, and surpassed only by Lake Superior. It is 578 ft. above sea-level, and has been found by accurate observations to have a lunar tidal wave of three inches. It is the outlet of numerous rivers, and is connected, near its s. extremity, by a canal, and sometimes by flooded rivers, with the Mississippi, which is believed to have been its ancient outlet. At its n.e. extremity it communicates with Lake Huron through the Straits of Mackinaw, 4 m. wide at the narrowest part. It has two large bays, Green Bay (100 m. long), and Grand Traverse Bay (30 m. long); the largest islands are Beaver Island, in the n. part (50 m. long) and Fox Islands, in the n.e. Its principal harbors are those of Chicago, Milwaukee, and Grand Haven; and its bold and, at certain seasons, dangerous shores are marked by 23 light-houses. It forms, with the lower lakes and the St. Lawrence, a natural outlet for one of the richest grain-growing regions in the world.

MICHIGAN, UNIVERSITY OF: founded 1837, Mar. 18, at Ann Arbor, Washtenaw co., Mich., on land granted by congress, 1826, to the territory of Mich. It was opened for students 1842, Sep. 20. It is part of the state system of public instruction; its purpose being to complete the course of instruction begun in the public schools, by giving a liberal education in the sciences, arts, and literature. It is supported by the state, and open to students of both sexes free of charge, except a small matriculation fee, and \$15 annually. While primarily intended for students from Mich., admission is granted to others, at a slight advance in the matriculation fee. The university has three departments: literature, science, and the arts; medicine and surgery, organized 1850; and law, organized 1859. It has also a special school of pharmacy, with regular course of two years; a special course in chemistry; a homeopathic medical college; and a dental college. Selected studies also may be pursued for any period not less than one term; while any graduate of the university, or of any other collegiate institution, may pursue a post-graduate course for advanced study in any department, whether for a second degree or not. The degrees conferred are, on the completion of the classical course, B.A.; of the scientific, B.S.; Latin and scientific, PH.B.; Greek and scientific, PH.B.; civil engineering, C.E.; mining engineering, M. E. Degrees are conferred also on the completion of the regular 2-years courses in law, in medicine, in analytical chemistry, and in pharmacy. The management of each department and school is vested in its own faculty; while all the faculties together, numbering about 50 professors and assistants, exclusive of a considerable

number of lecturers and assistants, constitute the university senate, which considers questions of common interest to them all. The libraries of the university, accessible to the students, aggregate about 67,000 vols., divided among the university library, the medical, the law, the libraries of two literary societies, and that of the Y. M. C. A. connected with the institution. The astronomical observatory contains one of the largest and best meridian circles of its kind in the country; the collimators for the same; a sidereal clock, made by Tiede, of Berlin; the library of the observatory, and the smaller instruments, among which is a chronograph with Bond's isodynamic escapement, for recording observations by the electro-magnetic method. The building consists of a main part, with 2 wings, and a movable dome; in the dome is mounted a large refracting telescope, with object-glass 13 in. in diameter, by Henry Fitz, of New York. A set of self-registering meteorological instruments has recently been added. The observatory was the gift of the people of Detroit, and was opened 1854. The university museum is in a recently erected fire-proof building 127 ft. long by 47 ft. wide. The collections in the various cabinets are full and valuable, and are constantly increasing. The geological cabinet contains about 45,000 specimens, including a very valuable and complete series of lithological and paleontological specimens; the zoölogical has about 120,000 specimens, including a complete series of the birds that visit Mich., and nearly complete series of the mammals of the state, and of the reptiles found e. of the Rocky mts., besides full collections of mollusca, fishes, and radiata; the botanical has about 75,000 specimens, of which about 10,000 are specimens of the plants of the state, besides a rare collection of Alaskan flora. In the mineralogical cabinet, besides an excellent collection of the minerals of the state, there is also one of about 6,000 European specimens purchased from the late Baron Lederer. In the department of history and fine arts there are collections of casts of the most important ancient busts and statues; of foreign engravings and photographic views; historical medallions, and copies of modern statues, busts, and reliefs by the great masters. The archeological cabinet has an interesting collection of relics of Indian and South Pacific islanders' instruments and utensils of domestic use. The anatomical museum is well furnished, and together with the clinical lectures enjoyed by the students makes the medical department one of the most thoroughly equipped in the country. Besides the observatory and museum, there are on the university grounds, embracing $44\frac{1}{2}$ acres, a central building called University Hall, for the department of literature, science, and art; several buildings for those of law and medicine; a chemical laboratory; and the residences of the president and professors. University Hall is 347 ft. front, 140 ft. deep in the centre, and 40 ft. on the wings. It is surmounted by a dome 140 ft. high from the ground.

MICHIGAN CITY—MICHOACAN.

In the front of the second story it has a handsome and well-arranged audience-room with seating capacity of 3,000. The total cost of the university buildings was about \$250,000. The proceeds from the sale of the original university lands constitute a fund of about \$543,000, held in trust by the state, and drawing interest at the rate of 7 per cent. A board of 8 regents has the control of the university. These are elected by the qualified voters of the state, and serve for a term of 8 years. Elections are held biennially for 2 regents, 2 retiring every 2 years. The president of the university is *ex officio* a member and president of the board of regents, by whom he is chosen for his office. Previous to 1852 the university had no president. Since then it has had four, including the present incumbent, James B. Angell, LL.D., who has held the office since 1871, though absent 1880-1, when he was U. S. minister to China and chairman of a special committee to negotiate a treaty with that country. In 1902 the univ. had 247 professors and instructors, 165,000 vols. in the libraries; scientific apparatus and library valued at \$1,035,000; grounds and buildings val. at \$1,400,000, productive fund \$545,964, income therefrom \$38,500, state appropriation \$285,250, tuition fees \$195,000; total income excepting board and lodging \$576,650; students in all depts. 3,712, of whom 1,137 are in the collegiate department.

MICHIGAN CITY: city in La Porte co., Ind., on the s. shore of Lake Michigan, at the mouth of Trail creek; principal lake-port of the state. It is 140 m. n. by w. of Indianapolis; 13 m. n.w. of La Porte; 40 m. e.s.e. of Chicago; at the junction of the Louisville New Albany and Chicago with the Indianapolis Peru and Chicago r.r., on the Michigan Central r.r., which has its extensive locomotive and car and repair works there. It has considerable trade in salt and lumber, and an important commerce on the lake, being a shipping point for iron and ore. Its chief industries are planing mills, foundries, manufactories of lumber, wagons, furniture, and boots and shoes. Besides being the seat of Ames College, it has a good system of graded public schools, with a high school and more than a dozen other schools. It has about 12 churches, 1 national bank (cap. \$125,000), 1 state bank (cap. \$50,000), 2 daily and 2 weekly newspapers, and is the seat of the northern state prison. Pop. (1880) 7,366; (1890) 10,776; (1900) 14,850.

MICHILIMACK'INAC: see MACKINAW.

MICHOACAN, *mē-chō-â-kân'*, or MECOACAN, *mā-chō-â-kân'*: one of the states of Mexico, extending from 18° to 21° n. lat. on the Pacific; 22,874 sq. m. A large portion of the territory is mountainous, and there are several volcanoes, of which Jorullo is most noted. The highest altitude in the state is about 17,000 ft. Among the mountains are many elevated valleys, which are remarkably fertile. There are 11 lakes, the largest of which, Chapala, is about 60 m. long by 20 m. wide.

MICIPSA—MICROCOSM.

The principal rivers are the Lerma and the Mescala, but there are many mountain streams by which the valleys are abundantly watered. Buceria and Maratua are the sea-ports. The climate ranges from the extremes of heat on the coast to cold on the mountains, and except in parts of the low land is quite healthful. The products of the various mines of gold, silver, copper, lead, iron, etc., amount to over \$1,000,000 per year, and lithographic stone and marble are quarried in considerable quantities. Domestic animals are reared in large numbers, and fish abound in the lakes and rivers. Among the manufactures are shawls, blankets, and silver-ware. Coffee, indigo, silk, and various dye-woods are exported. The cap. is Morelia. There are a large number of schools and a state college. Pop. (1900) 935,849.

MICIP'SA: see JUGURTHA.

MICKLE, a. *mīk'l* [AS. *micel*; Icel. *mikill*; Goth. *mikils*; Scot. *meikle* or *muckle*, much, great]: in OE., much; great.

MICO, n. *mī'kō* [Sp. *mico*]: a small S. Amer. monkey.

MICRASTER, n. *mī-krās'tér* [Gr. *mikros*, small; *astron*, a star]: in *geol.*, a genus of sea-urchins abounding in the Chalk, and so termed from the star-like arrangement of its small or incomplete ambulacral furrows.

MICRO, *mī'kro* [Gr. *mikros*, small]: a prefix in scientific words signifying 'smallness': among electricians, and on the C. G. S. system, division by a million.

MICROBES, n. plu. *mī'krōbz* [Gr. *mikros*, small; *bios*, life]: minute organisms found in the blood of animals suffering from splenic fever, as its producing cause; a general term for any very minute organisms of the nature of Bacteria, comprising micrococcus, etc.: see BACTERIUM: GERM THEORY: KOCH, ROBERT: PASTEUR, LOUIS.

MICROCEPHALOUS, a. *mī'krō-sēf'ā-lūs* [Gr. *mikros*, small; *kephālē*, head]: having a small or imperfectly developed head or cranium. MICROCEPHAL'IC, a. *-sē-fāl'ik*, term applied to skulls having a capacity below 1,350 cubic centimetres.

MICROCHRONOMETER: see MICRONOMETER.

MICROCOCCUS, n. *mī'krō-kōk'ūs* [Gr. *mikros*, small; *kokkos*, a kernel]: any minute form or organism supposed to have life; a genus of the Bacteria, the basis of all yeast formations, and a source of fermentation.

MICROCOSM, n. *mī'krō-kōzm* [Gr. *mikros*, small; *kosmos*, the world]: the little world, applied to man as the cosmos in miniature, or as supposed to be an epitome of the universe or great world, which was called the *macrocosm* (great world). MICROCOS'MIC, a. *-kōz'mīk*, or MICROCOS'MICAL, a. *-kōz'mī-kāl*, pertaining to the microcosm.—The belief, current in ancient times, that the world or cosmos was animated, or had a soul (see ANIMA MUNDI), led to the notion that the parts and mem-

MICROCOSMIC SALT—MICROGONIDIUM.

bers of organic beings must have their counterparts in the members of the cosmos. Thus, in a hymn ascribed to Orpheus, the sun and moon are as the eyes of the animating godhead, the earth and its mountains as his body, the ether is as his intellect, the sky as his wings. The natural philosophers of the 16th c.—Paracelsus at their head—took up this notion anew, modified it, and considered the world as a human organism on the large scale, and man as a world, or cosmos, in miniature. With this was associated the belief that the vital movements of the microcosm exactly corresponded to those of the macrocosm, and represented them, as it were, in copy; and this led naturally to the further assumption that the movements of the stars must exercise an influence on the temperament and fortunes of men: see ASTROLOGY.

MICROCOSMIC SALT: sodium ammonium hydrogen phosphate, which crystallizes with 4 equivalents of water, its formula being $\text{Na.NH}_4.\text{H.PO}_4 + 4\text{Aq.}$ It is prepared by mixing a hot solution of 6 parts of phosphate of soda with a concentrated solution of 1 part of muriate of ammonia, when the M. S. crystallizes in large transparent prisms, while common salt remains in solution. On the application of heat, it first loses its water of crystallization, and then its oxide of ammonium and basic water, so that only metaphosphate of soda remains, which, from its ready fusibility into a colorless glass, is valuable as a flux in blow-pipe experiments: see BLOW-PIPE. This salt was obtained originally from decomposed urine, whence its name, alluding to man, the 'microcosmos.'

MICROCOUSTIC, a. *mī-krō-kow'stīk* [prefix *micro-*; Eng. *acoustic*]: serving to increase small or indistinct sounds; of or pertaining to a microcoustic: N. an aural instrument for collecting sounds for the partially deaf; an auricle or speaking-trumpet.

MICROCRITH, n. *mī'krō-krīth* [prefix *micro-*; Eng. *crith*]: in *chem.*, the weight of an atom of hydrogen.

MICROFARAD, n. *mī-krō-fār'ād* [prefix *micro-*; Eng. *farad*]: in *electro-magnetics*, the millionth part of a farad. The farad being too large for practical purposes, the M. is often used in its place.

MICROGEOLOGY, n. *mī-krō-jē-ōl'ō-jī* [prefix *micro-*; Eng. *geology*]: department of the science of geology whose facts are ascertained by the use of the microscope.

MICROGONIDIUM, n. *mī-krō-gō-nīd'i-ūm* [Gr. *mikros*, small; *gonos*, offspring, seed; *eidos*, resemblance]: in *Algæ*, a single small zoöspore found in a germinating cell, formed at the expense of the contained plastic materials.

MICROGRAPH—MICROMETER.

MICROGRAPH, n. *mī'krō-grāf* [Gr. *mikros*, small, *graphō*, I write, I draw]: instrument for executing extremely minute writing and engraving; its general principle is that of the pantograph.

MICROGRAPHY, n. *mī-krōg'rā-fī* [Gr. *mikros*, small; *graphō*, I describe]: a description of microscopical objects. **MICROGRAPHIC**, a. *mī'krō-grāf'ik*, relating to micrography.

MICROLESTES, n. *mī'krō-lēs'tēz* [Gr. *mikros*, small; *lēstēs*, a robber]: in *geol.*, a small fossil insectivorous quadruped.

MICROLITE, n. *mī'krō-līt* [Gr. *mikros*, small; *lithos*, a stone]: mineral occurring in exceedingly small octahedral crystals, hence the name. It has lately been found in well-defined crystals up to an inch and a half in diameter, and larger imperfect ones up to four lbs. in weight. Crystallization, isometric; lustre, resinous; color, wax-yellow to brown; streak, pale ochereous yellow; fracture, conchoidal, brittle: it is found with albite, etc., at Chesterfield, Mass., Utö, Sweden, and at the mica mines, Amelia co., Virginia.

MICROLITH, n. *mī'krō-līth* [prefix *micro-*; Gr. *lithos*, a stone]: term used in various significations; e.g., as equivalent to *crystallite*, i.e., an aggregation of globular microscopic forms; also as applied to minute forms shaped like a lath or an hour-glass. The latter is now probably the most frequent application of the term.

MICROLITHIC, a. *mī'krō-līth'ik* [Gr. *mikros*, small; *lithos*, a stone]: formed of small stones.

MICROMETER, n. *mī-krōm'ē-tēr* [Gr. *mikros*, small; *metron*, a measure]: instrument employed in measuring small objects, spaces, or very small angles formed by bodies at a remote distance. **MICROMETRICAL**, a. *-mēt-rī-kāl*, pertaining to the micrometer. **MICROMETRY**, n. *-ē-trī*, the art of measuring minute objects or angular distances with a micrometer.—The *Micrometer* is of different forms, depending on different principles: these forms may be divided into two sections, according as they are applied to Physics or Astronomy. Of the former section are the Vernier (q.v.) and the Micrometer Screw, the latter instrument being merely a screw with a very regular thread, and a large round head, which is carefully graduated, generally to sixtieths, and furnished with an index. It is easily seen that if a complete turn of the screw advance its point $\frac{1}{20}$ of an inch, a turn sufficient to pass the index from one graduation to another will only advance it $\frac{1}{1200}$ of an inch, etc. This is the micrometer used in the construction and graduation of instruments. Of those applied to astronomical purposes, the most simple is a short tube, across the opening of which are stretched two parallel threads, or very fine wires, or spider-lines, which are moved to or from each other by screws. These threads are crossed

MICRONESIA—MICROPHONE.

by a third perpendicularly, and the whole apparatus is placed in the focus of a lens. The distance of two stars is found by adjusting the two parallel threads, one to pass through the centre of each star, taking care that the threads are placed perpendicular to the line joining the stars, and finding how many turns and parts of a turn of the screw are required to bring the wires to coincide. The angle of position of two stars also is obtained by turning round the instrument till the third wire, which is normally horizontal, bisects both stars, and reading off on the circumference the arc passed over. *Fraunhofer's suspended annular micrometer* consists merely of a steel ring surrounded by a flat rim of glass, and the position of the star is deduced from the time when it crosses the ring and its path while within it. The Abbé Rochon substituted for the wire micrometer one made of two prisms of rock-crystal or Iceland spar, capable of double refraction.

MICRONESIA: see POLYNESIA.

MICRONOMETER, n. *mī-krō-nōm'ē-tēr* [a contraction of *microchronometer*]: kind of watch intended for measuring short intervals of time, e.g., the flight of a projectile, etc. After being wound up in the ordinary way, it is set in motion by pressing a spring with the finger, upon withdrawing which it is instantaneously stopped.

MICROPHONE, n. *mī'krō-fōn* [Gr. *mikros*, small; *phonē*, a sound]: an electrical instr. for reproducing, and rendering with vastly increased and startling distinctness, very minute and inaudible sounds—e.g., the tick of a watch or the tread of a fly—at almost any distance from its original source, in connection with the telephone. This instrument, invented 1878 by Prof. Hughes, does for faint sounds what the Microscope (q.v.) does for matter too small for sight; the fall of a bit of tissue-paper being rendered audible at many miles' distance. In principle the M. illustrates the action of sonorous vibrations on the strength of an electric current. One of the most sensitive substances for microphonic action is willow-charcoal, plunged in a state of white heat into mercury. The theory is that in a homogeneous conductor the compressions and dilatations of the molecules balance each other, and no variation of current ensues, while under minute subdivision, with electrical continuity, sonorous waves affect the strength of an electric current, and variations in the current reproduce sonorous waves. One form of M. consists of a piece of mercury-tempered carbon, an inch long, placed vertically between two carbon-blocks hollowed to receive its ends, wires connecting the blocks with the battery and the receiver by which the sounds are to be heard. 'A piece of willow-charcoal,' says the inventor, 'the size of a pin's head, is sufficient to reproduce articulate speech.' Two nails laid parallel, with wire connections, and a third nail laid across them, make a simple form of microphone. A few cells of any form of battery may be used. A con-

MICROPHOTOGRAPHY—MICROPYLE.

tinuous sound has been made by the mutual interaction of the M. and Telephone (q.v.), each instrument in turn repeating the sound made by the other. Many useful applications of the M. have been made or suggested. MICROPHON'ICS, n. -īks, the science or art of augmenting weak or small sounds.

MICROPHOTOGRAPHY, n. *mī-krō-fō-tōg'ra-fī* [prefix *micro-*; Eng. *photography*]: photographic process by which an object is reduced in size, while its exact form is retained. By means of this instrument letters can be reduced to a minute space, and afterward either enlarged by photography or read with a microscope. Practical use of the process was made during the siege of Paris in 1870, in order to communicate with those inside that city by means of messages conveyed by carrier-pigeons, the transcript being taken on paper of extreme thinness, so that the pigeons were able to carry a considerable number of messages.

MICROPHYLLINE, n. *mī'krō-fīl'lin* [Gr. *mikros*, small; *phyllon*, a leaf]: a material composed of minute leaflets or scales.

MICROPHYTA, n. plu. *mī-krōf'i-tă*, or MICROPHYTES, n. plu. *mī'krō-fīts* [Gr. *mikros*, small; *phuton*, a plant]: in *geol.*, a term applied to minute forms of vegetable life; microscopic plants. MI'CROPHY'TAL, a. -fī'tăl, applied to deposits of minute forms of life, chiefly of vegetable origin.

MICROPYLE, n. *mī'krō-pīl* [Gr. *mikros*, small; *pulō*, a gate]: in *bot.*, the opening or foramen of the seed for the escape of the root of the embryo.

MICROSCOPE.

MICROSCOPE, n. *mī'krō-skōp* [Gr. *mikros*, small; *skopēō*, I view]: instrument for viewing minute objects by magnifying them. **MICROSCOP'IC**, a. *-skōp'ik*, or **MICROSCOP'ICAL**, a. *-ī-kāl*, very small; visible only by the aid of a microscope. **MICROSCOP'ICALLY**, ad. *-lī*. **MICROSCOPIST**, n. *mī-krōs'kō-pīst* or *mī'krō-skōp'īst*, one who is skilled in the use of a microscope. **MICROSCOPY**, n. *mī-krōs'kō-pī*, the use of the microscope; investigations with the microscope.

MICROSCOPE: instrument for use in examining objects so small as to be almost or quite undiscernible by the unaided eye. Its early history is obscure; but as it is quite evident the property of magnifying possessed by the lens must have been noticed as soon as it was made, we are quite safe in attributing its existence in its simplest form to a period considerably anterior to the time of Christ. It is generally believed that the first compound M. was made by Zacharias Jansen, a Dutchman, 1590, and was exhibited to James I. in London by his astronomer, Cornelius Drebbel, 1619. It was then very imperfect, coloring and distorting all objects. For many years, it was more a toy than a useful instrument, and it was not until the invention of the achromatic lens by Hall and Dollond, and its application to the M. by Lister and others, that it reached its present advanced position among scientific instruments.

An object to be magnified requires simply that it be brought nearer to the eye than when first examined; but as the focal distance of the eye ranges from 6 to 14 inches—10 inches being the average focal distance—it follows that a limit to the magnifying power of the eye is attained whenever the object to be examined is brought so near. If, however, we blacken a card and pierce a hole in it with a fine needle, and then examine a minute object, as, for instance, the wing of an insect held about an inch from the card, we shall see it distinctly, and that too, magnified about ten times its size. This is explained by the fact that the pin-hole limits the divergence of the pencil of rays, so that the eye can converge it sufficiently on the retina to produce a distinct impression, which is faint; and did not the blackened card exclude all other light, it would be lost. If we now remove the blackened card without either removing our eye or the object under examination, it will be found that the insect's wing is almost invisible, the unassisted eye being unable to see clearly an object so near as one inch; thus demonstrating the blackened card with the needle-hole in it to be as decided a magnifying instrument as any set of lenses.

By the apparent size of an object is understood the angle formed by two lines drawn from the centre of the eye to the extremities of the object, which is larger when the object is nearer the eye than when further removed. This angle is called the angle of vision, and is quite distinct from the angle of the pencil of light, by which the object is seen. The focal length of a lens determines its

MICROSCOPE.

magnifying power. The object to be examined is placed in its focus, so that the light which diverges from each point may, after refraction by the lens, proceed to the eye in lines as nearly parallel as is necessary for distinct vision. Thus, in fig. 1, AB is a double convex lens, in the

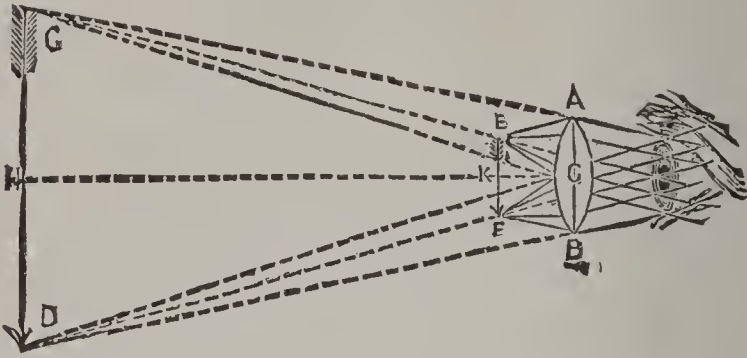


Fig. 1.

focus of which we have drawn an arrow, EF, to represent the object under inspection. The cones drawn from its extremities are portions of the rays of light diverging from these points and falling on the lens. These rays, if not interrupted in their course by the lens AB, would be too divergent to permit their being brought to a focus upon the retina by the lenses which constitute the eye. But as they are first passed through the lens AB, they are bent into nearly parallel lines, or into lines diverging from some points within the limits of distinct vision, as from CD. Thus bent, these rays are received by the eye as if proceeding from the larger arrow CD, which we may suppose to be ten inches from the eye, and then the ratio of the length of the virtual image to that of the real arrow (nearly 10 to 1) gives the magnifying power of the lens in question. The ratio of CD to EF is the same as that of HG to KG. Now, HG is the distance of distinct vision, and KG the focal length of the lens, so that the magnifying power of a lens is obtained by dividing the distance of distinct vision (ten inches for most individuals) by its focal length. Thus, if the focal length of a lens be $\frac{1}{4}$ inch, the magnifying power is 10

$10 \div \frac{1}{4} = 40$. This supposes that the distance between the eye and the lens is so small as not materially to interfere with the correctness of this statement.

We have supposed the whole of the light to enter the eye through the lens AB (fig. 1), but it must now be stated that so large a pencil of light passing through a single lens would be so distorted by its spherical figure, and by the chromatic dispersion of the glass, as to produce a very indistinct and imperfect image. This is so far rectified by applying a stop to the lens, so as to allow only the central portion of the pencil to pass. But while such a limited pencil would represent correctly the form and color of the object, so small a pencil of light is unable to bear diffusion over the magnified picture, and is therefore incapable of displaying those organic markings on

animals or plants which are often of so much importance in distinguishing one class of objects from another. Dr. Wollaston was the first to overcome this difficulty, which he achieved by constructing a doublet (fig. 2), which consists of two plano-convex lenses, having their



Fig. 2.

focal lengths in the proportion of 1 to 3, and placed at a distance best ascertained by experiment. Their plane sides are placed toward the object, and the lens of shortest focal length next the object. By this arrangement, the distortion caused by the first lens is corrected by the second, and a well-defined and illuminated image is seen. Dr. Wollaston's doublet was further improved by Mr. Holland, who substituted two lenses for the first in Dr. Wollaston's doublet, and retained the stop between them and the third. This combination, though generally called a triplet, is virtually a doublet, inas-

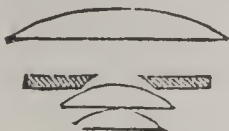


Fig. 3.

much as the two lenses accomplish only what the anterior lens did in Dr. Wollaston's doublet, though with less precision. In this combination (fig. 3) of lenses, the errors are still further reduced by the close approximation of the lenses to the object, which causes the refractions to take place near the axis; and thus we have a still larger pencil of light transmitted, and have also a more distinct and vivid image presented to the eye.

Simple Microscope.—By this term is meant an instrument by means of which we view the object through the lens directly. These instruments may be divided into two classes—those simply used in the hand, and those provided with a stand or frame, so arranged as to be capable of being adjusted by means of a screw to its exact focal distance, and of being moved over different parts of the object. The single lenses used may be either a double convex or a plano-convex. When a higher power is wanted, a doublet, as above described, may be employed, or a Coddington lens, which consists (fig. 4)



Fig. 4.

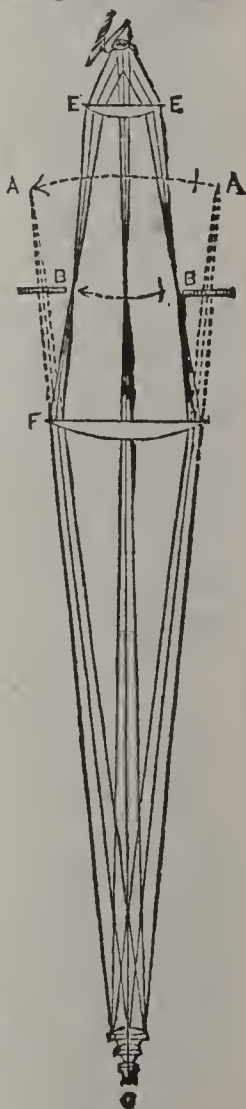
of a sphere in which a groove is cut and filled up with opaque matter. This is perhaps the most convenient hand lens, as it matters little, from its spherical form, in what position it is held. In the simple M., single or combined lenses may be employed, varying from a quarter to two inches. There are many different kinds of stands for simple microscopes made, but as they are used principally for dissection, the most important point next to good glasses is to secure a firm large stage for supporting the objects under examination. When low powers alone are used, the stage-movements may be dispensed with; but when the doublet or triplet is employed, some more delicate adjustment than that of the hand is necessary.

Compound Microscope.—In the compound M. the observer does not view the object directly, but an inverted image or picture of the object is formed by one lens or

MICROSCOPE.

set of lenses, and that image is seen through another lens. The compound M. consists of two lenses, an object and an eye lens; but each of these may be compounded of several lenses playing the part of one, as in the simple M. The eye-lens is that placed next the eye, and the object-lens that next the object. The former is called also the ocular, and the latter the objective. The object-glass is generally made of two or three achromatic lenses, while the eye-piece generally consists of two plano-convex lenses, with their flat faces next the eye, and separated at half the sums of their focal lengths, with a diaphragm or stop between them. Lenses of high power are so small as to admit only a very small beam of light, and consequently what is gained in magnifying power is often worthless from deficient illumination. Various devices have been employed to overcome this difficulty. The light may be concentrated by achromatic condensers placed beneath the stage, or the curvature of the lens may be such as to allow as large a number of divergent rays as possible to impinge upon it. Such a lens is said to have a large 'angle of aperture,' the angle of aperture being that made by two lines converging from the margins of the lens to its focal point. Recently lenses, termed 'immersion lenses,' have been constructed of such a curvature that, when immersed in a drop of water placed over the object, light is admitted on all sides. With an immersion lens, there is high magnifying power with sufficient illumination.

The following diagram (fig. 5) explains the manner in which the compound M. acts. We have here represented the triple achromatic objective, consisting of three achromatic lenses combined in one tube, in connection with the eye-piece, which consists of the field-glass FF and the eye-glass EE. Three rays of light are represented as proceeding from the centre, and three from each end of the object. These rays would, if not interfered with, form an image at AA; but coming in contact with the field-glass FF, they are bent, and made to converge at BB, where the image is formed, at which place a stop or diaphragm is placed to intercept all light, except what is required to form a distinct image. From BB, the rays proceed to the eye-glass exactly as they do in the simple M., and as explained in fig. 1. The image, therefore, formed at BB is viewed as an original object by an observer through the eye-piece EE. The lens FF is not essential to a compound M.; but as it is quite evident that the rays proceeding to AA



Fig

MICROSCOPE.

would fall without the eye-lens EE, if it was removed, and only a part of the object would thus be brought under view, it is always made use of in the compound M.

A mirror is placed under the stage for reflecting the light through the object under observation. This method of illumination by transmitted light is used when the object is transparent. When opaque, light is reflected on the object by a bull's-eye lens, called a condenser. The best instruments are supplied with six or seven object-glasses, varying in magnifying power from 20 to 2,500 diameters. The eye-pieces supplied are three in number, each of which consists of two plano-convex lenses, between which a stop or diaphragm is placed, half-way between the two lenses. As the magnifying power of a compound M. depends on the product of the magnifying powers of the object-glass and the eye-piece, it follows that its power may be increased or diminished by a change in either or both of these glasses. In the mechanical ar-

rangements, it is of importance to have the instrument so constructed that, while every facility is afforded for making observations and easy means of adjustment, there should also be great steadiness, without which, indeed, no satisfactory results will be obtained. These ends are achieved in various ways, of which fig. 6 is one of the simplest: *a*, brass stand, supported on three feet; *b*, mirror, supported on trunnions; *c*, diaphragm, pierced with circular holes of various sizes, to regulate the admission to the object of reflected light from the mirror; *d*, stage-plate, on which the object is placed; *e*, screw, with milled head for fine adjustment; *f*, the object-glass or objective; *g*, brass tube, in which the body of the instrument is moved, to effect the coarse adjustment;

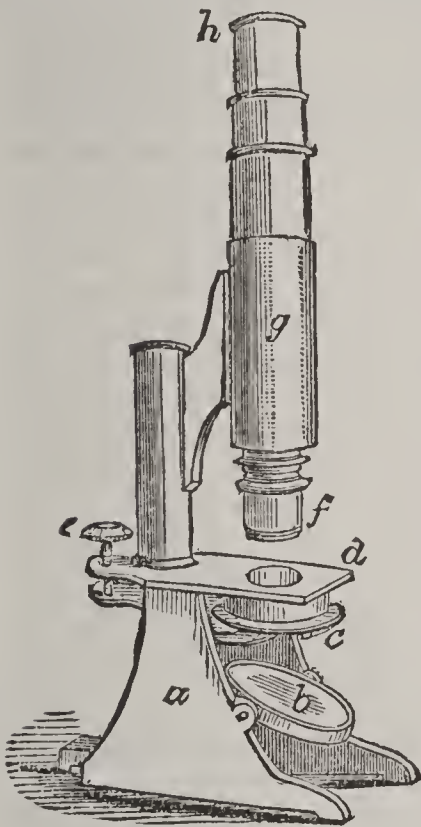


Fig. 6.

h, the eye-piece or ocular. See SOLAR MICROSCOPE.

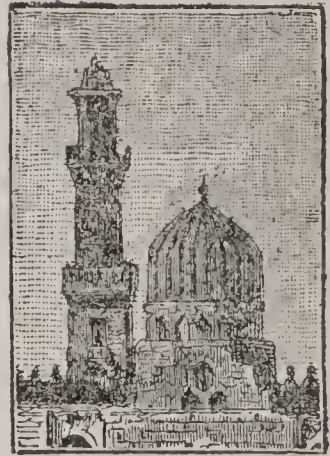
The M. has now become so important an instrument in education that almost every department of science in which it can be employed has a M. suited to its particular kind of work, and a special treatise explaining and illustrating its use; and many branches of science have instruments peculiarly their own. Thus, chemists, anatomists, zoölogists, etc., have each a special M. From this instrument the chemist, and natural philosophers generally, have derived great assistance in studying the different kinds of crystals; for, by means of it, they can not only observe and recognize the great variety of forms

that exist, but at any moment, and with little trouble, they may witness the process of crystallization, and leisurely study it. Those sciences in which it is most used, and for which it has done most, are anatomy, physiology, botany, zoölogy, medicine, mineralogy, and geology. In the practice of medicine, all medical men who aim at a scientific treatment of disease have fully recognized its usefulness as an agent in diagnosis, especially in diseases of the kidneys. In the detection of crime and the vindication of innocence, it is no less useful, as by means of it it is possible to determine with certainty whether a suspicious stain, found, e.g., on the clothing of an individual charged with murder, has been caused by blood or by another coloring-matter. In like manner, it can be determined whether hair found in similar circumstances belongs to a human being or not. The M. makes it possible also to distinguish the difference between substances that have a similar chemical reaction (e.g., the various kinds of starch, as flour, potato, sago, etc.); and thus we are provided with an agent quick in detecting adulteration.

Amateur observers choosing an instrument should remember that the simpler it is the better. The essential point is to have good glasses, which are tested by their power of showing some very minute markings, such as we find on diatoms. The circumference of the field of view should not be tinged with color, and the definition should be as good at the edge as at the centre. The beginner should use low powers in preference to high ones. The best light is that reflected from a white cloud during the day. Artificial light should, if possible, be avoided. The table must be steady on which the microscope is placed, and when not in use the instrument should be covered by means of a glass shade. The observer also requires a few oblong glass slides and a few circles of thin glass, called covering-glasses, to lay over the preparation under examination. For making sections, dissecting, and the various manipulatory operations attending the use of the M., he requires, moreover, a pair of forceps, a knife, or, perhaps better, a razor ground flat on one side, a few needles fixed in handles, and two or three hair-pencils. So equipped, the observer is able to begin examinations of texture at once with pleasure and advantage. Begin with simple objects, such as pollen and thin slices of the cuticle of flowers, mosses, and different kinds of starch, such as *tous le mois*, buck yam, cycas, arrow-root, etc., and notice particularly their different characters. Make as thin a section as possible, place it on the centre of the slide, and allow a drop of water to fall on it from the end of the handle of the needle. Then allow the covering-glass to fall gently on it—obliquely, so as to press out any small bubbles of air. Also have near a few bottles containing ‘reagents,’ such as dilute acetic acid (equal parts of pyroligneous acid and water) and liquor potassæ: by means of these reagents, peculiarities of structure may often be observed.



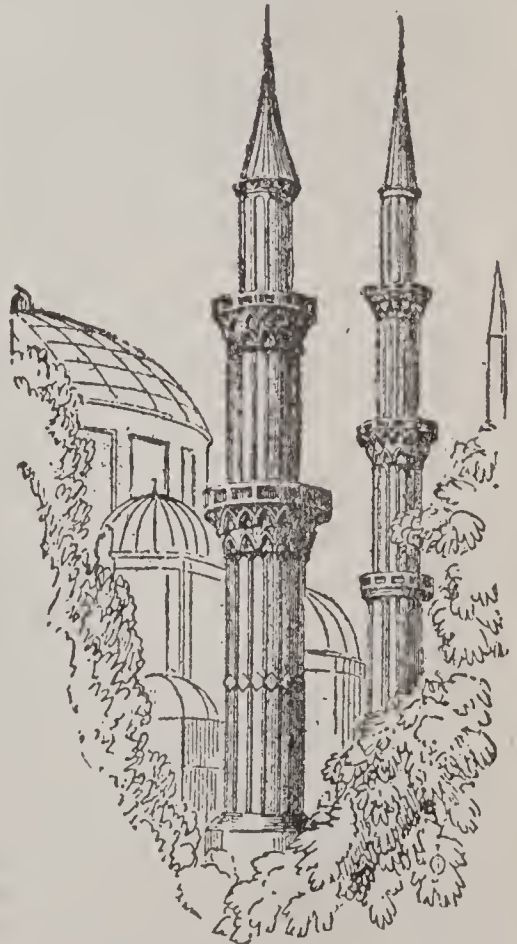
Mihrab, and Mimbar or Pulpit, in a Mosque.



Minaret.



Midas.



Minarets, Mosque of St. Sophia,
Constantinople.

MICROSCOPIC ANIMALS—MICROTASIMETER.

Microscopes vary much in prices, from \$1 to more than \$500. A good serviceable dissecting simple M. may be had from any philosophical-instrument maker for from about \$2.50 to \$4. Compound microscopes are more expensive, but a good instrument for beginners can be had at \$7 or \$8. It has one eye-glass and three object-glasses, and magnifies from 70 to 200 diameters. If a superior instrument is wished—one suited for most purposes of observation and research—any one of the following will be found well worth the price: The M. of Hartnack, with a joint, so that it may be inclined at any angle, has two eye-pieces, two object-glasses, magnifies from 50 to 450 diameters, and costs about \$35; Nachet's M. has three eye-pieces, three object-glasses, magnifies from 50 to 750 diameters, and costs \$50; Smith and Beck's educational M. has two eye-pieces, two object-glasses, magnifies from 50 to 350 diameters, and costs \$50. Microscopes are sold for from \$25 to \$500, with various number of glasses.

For a more complete account of the different kinds of microscopes, and the various purposes to which they are applied, see Quekett, *On the Microscope* (1855); Carpenter, *The Microscope* (1862; 6th ed. 1880); works on the M. by Hogg and Beale; *The Microscopist*, by Wythe (3d ed. 1877).

MICROSCOP'IC ANIMALS: see ANIMALCULE.

MICROSPORANGIA, n. *mī'krō-spō-rānj'ī-ă* [Gr. *mikros*, small; *spora*, seed; *anggos*, a vessel]: in *bot.*, cells or thecæ containing microspores.

MICROSPORES, n. plu. *mī'krō-spōrz* [Gr. *mikros*, small; *spora*, seed]: in *bot.*, small reproductive spores in the capsules of Lycopods; applied to certain vegetable parasites present in various cutaneous affections—also in same sense, MICROSPORON, n. *-spō'rōn*.

MICROSTYLAR, a. *mī-krō-stī'lér* [prefix *micro-*; Eng. *stylar*]: in *arch.*, having a small style or column; an epithet applied to a style of architecture in which there is a separate small order to each floor.

MICROTASIMETER, *mī-krō-ta-sīm'ě-tér*: instrument for measuring very minute variations of pressure in bodies, caused by changes of temperature, moisture, etc.; invented by Thomas A. Edison. It is based on the combined principles of the pyrometer, hygrometer, and barometer. It was successfully used during the solar eclipse of 1878 and since for measuring the heat given forth by the sun's corona. It is used also to note the variations of temperature, caused by clouds passing over the sun's disk, or by increase or decrease of moisture. Its peculiarity consists in the effect which the pressure of the expanding rod has on the electric resistance of a piece of carbon placed in the circuit of a galvanic battery. A rod of vulcanite is used when slight variations of temperature are to be noted. This rod is fixed in a strong frame, kept at an even temperature, with its lower end fitted into a slot in a metal plate which rests on a carbon button. This button is an electric circuit which includes

MICROTHERMS—MID.

a galvanometer. The least variation in the length of the rod, caused by its expansion owing to the heat rays being centred upon it by means of a kind of funnel, changes the pressure on the button and thus the resistance of the current, which is at once indicated by the galvanometer. For use as a hygrometer a strip of gelatine is substituted for the vulcanite.

MICROTHERMS, n. plu. *mī'krō-thérnz* [Gr. *mikros*, small; *thermē*, heat]: in *bot.*, plants which require only a small degree of heat to bring them to perfection.

MICROTOME, n. *mī'krō-tōm* [Gr. *mikros*, small; *tomē*, a cutting]: an instrument for making very fine sections for the purpose of being examined under the microscope.

MICROZAMIA, *mī-krō-zā'mī-a*: genus of plants of nat. order *Cycadaceæ*: widely diffused over Australia. The fronds resemble those of palms, and are used in the Rom. Cath. Church on Palm Sunday. The underground stem is large and turnip-like, but covered with scales or leaf-scars, and contains a substance resembling tragacanth. The nuts of *M. spiralis* are edible, but are used only in times of scarcity.

MICROZOA, n. *mī'krō-zō'ā* [Gr. *mikros*, small; *zōōn*, an animal]: a term employed to denote minute animal organisms whose forms can only be defined by the aid of the microscope. MICROZO'AL, a. -āl, pertaining to.

MICROZYMES, n. plu. *mī'krō-zīmz* [Gr. *mikros*, small; *zumē*, fermenting matter, leaven]: a general term for very minute organized particles which present themselves in liquids fermenting or undergoing decomposition; the minute organized particles which are supposed to be the contagious matter in zymotic diseases.

MICTURITION, n. *mīk'tū-rīsh'ūn* [L. *micturītus*, having the desire to make water]: the act of making water, or the desire to pass the urine; a too frequent passing of urine in consequence of disease.

MID, a. *mīd* [Goth. *midja*; Gr. *mesos*; Skr. *madhya*; L. *mediūs*; Icel. *midr*; Ger. *mittel*, middle: Icel. *midill*, means—from *midla*, to divide]: at an equal distance from the extremes; middle. MIDDAY, n. noon: ADJ. pertaining to noon; meridional. MIDFEATHER, in a *steam-engine*, a vertical water-space in a fire-box or combustion-chamber. MID-HEAVEN, or MID-AIR, the middle part of the heaven or sky; the position of anything raised and suspended considerably above the surface of the earth. MIDLAND, a. being in the interior; distant from the sea. MID-LENT, 4th Sunday in Lent; the middle of Lent. MID-LIFE, the middle of the age of man, or the period of life about 50. MIDNIGHT, 12 o'clock; the middle of the night. MIDRIB, in *bot.*, the principal

MIDA—MIDDELBURG.

nerve or vein, which extends from the base of the leaf to its apex. MID-SHIP, pertaining to the middle part of a ship. MIDSHIPMAN, a junior naval officer in a ship of war or a first-class merchant vessel (see below). MID-STREAM, the middle or centre of the stream. MID-SUMMER, the middle of summer; the time about June 21st. MID-SUMMER'S DAY, one of the quarter-days of the year in England, occurring June 24 (see LANDLORD AND TENANT). MID-SUMMER EVE (see ST. JOHN'S, EVE OF). MIDWAY, a. being in the middle of the way or distance: N. the middle of the distance: AD. half-way. MID-WINTER, the middle of the winter, about Dec. 21; the middle of severe winter weather.

MIDA, n. *mī'dā* [Gr. *midas*, a destructive insect in pulse]: the grub of the bean-fly.

MIDAS, *mī'das*: common representative name in Greek tradition of the more ancient Phrygian kings, of whom M., legendary son of Gordius and Cybele, is the most famous, said to have been pupil of Orpheus. He was closely connected with the cultus of Dionysus or Bacchus, and among the many legends regarding him is one, that Bacchus granted his wish that whatever he touched might become gold; from which so great inconvenience ensued, that he was glad to get relief from the burden by washing, at the command of the god, in the Pactolus, the sands of which became thenceforth productive of gold. Another legend represents him as having offended Apollo by assigning the prize in a musical competition to Pan, and as having therefore been endowed by him with a pair of ass's ears, which he concealed under his Phrygian cap, but which were discovered by his servant. The historical Phrygian monarchy was destroyed by the Cimmerians about B.C. 760, and the last King M. committed suicide.

MIDAS: genus of platyrrhine monkeys, of family *Hapalidæ*, *hăp-ăl'i-dē*: see TAMARIN.

MIDDELBURG, *mīd'del-bérch*: town of the Netherlands, cap. of the province of Zeeland, in the island of Walcheren. It is connected with the sea by a canal, five m. long, admitting ships of heavy burden, and is a station of the railway from Flushing to Roosendaal to join the Dutch and Belgian lines. The city is nearly circular, and a league in circumference, surrounded by a broad canal. In former times, M. was one of the leading mercantile cities of the United Provinces, sending many ships to the E. and W. Indies, America, and all European ports, founding the colonies of Surinam, Berbice, Essequibo, Demerara, etc.; but the opening of the Scheldt for Antwerp, and other causes, have reduced the foreign trade to single ships to Java. Many of the inhabitants are wealthy, which, with its being the meeting-place of the provincial states of Zeeland, and having considerable trade in grain, salt, etc.—making beer, vinegar, starch, leather, and with snuff, chocolate, oil and saw mills, and foundries—make it still a city of

MIDDEN—MIDDLE.

importance. It is the finest city of the n. provinces, having handsome houses, ornamented with gardens, and the canals and streets shaded with trees. The town-house, founded 1468, has a beautiful tower, and is decorated with 25 colossal statues of Counts and Countesses of Holland. At the beginning of the 12th c., an abbey was founded, which was, later, enriched by Willem II., Count of Holland and Zeeland. The buildings are now occupied as the meeting-place of the provincial states. M. does not date further back than the 9th c. In 1574 the Spaniards, under Mondragon, were compelled by famine to give up M., after having defended it 22 months against Prince Willem I. Though troops are stationed in M., it is no longer tenable against an enemy. Pop. (18880) 16,050; (1888) 16,455; (1893) 17,560.

MIDDEN, n. *mīd'n* [Icel. *moddyngia*; Dan. *mödding*, a dunghill—from Icel. *mod*, refuse; *dyngia*, a heap]: in *Scot.* and *N. of Eng.*, a dunghill; a manure-heap; an ancient deposit or mound of refuse made by man.

MIDDLE, a. *mīd'l* [from MID, which see]: equally distant from the extremes; intervening: N. the point or part equally distant from the extremities; the time which passes, or the events which happen, between the beginning and the end. MIDDLE-AGED, at about the age of 50. MIDDLE BASE and MIDDLE CHIEF, in *her.* (see POINTS OF ESCUTCHEON). MIDDLE C, in *music*, the note a fifth above the F or bass-clef, and a fifth below the G or treble-clef. The C clef always represents Middle C. MIDDLE CLASS, a name used to designate the classes of society which include professional men, merchants and traders, bankers, and the like; the classes between mechanics and the aristocracy. MIDDLE-DECK, in a ship having three decks, that situated between the other two. MIDDLE GROUND, in *painting*, the central portion of a landscape. MIDDLE LATITUDE SAILING (see SAILINGS). MIDDLE-MAN, an agent between two parties; in *Ireland*, one who rents large tracts of land from the proprietor, and lets out small portions to the peasantry. MID'DLEMOST, a. in the middle or nearest the middle. MIDDLE PASSAGE, in the *slave trade*, the part of the Atlantic Ocean lying between Africa and the West Indies. MIDDLE POST, in *arch.*, the same as king-post. MIDDLE-SIZED, neither very large nor very small. MIDDLE TEMPLE, one of the four English Inns of Court, having the exclusive privilege of calling persons to the bar (see INNS OF COURT). MIDDLE TERM, in *logic*, the term of a syllogism with which the two extremes are separately compared. MIDDLE TINT, in *painting*, a mixed tint in which bright colors do not predominate. MIDDLE VOICE, in the *Gr. verb*, a mood in which the agent is represented as performing some act to or upon himself, as *I struck myself*.

MIDDLE AGES—MIDDLEBOROUGH.

MIDDLE AGES: great historic period between the times of classic antiquity and modern times. The beginning and close of this period are not very definite; it is usual, however, to regard the M. A. as beginning with the overthrow of the Western Roman Empire 476; and there is a somewhat general concurrence in fixing on the period of the Reformation, or, with some writers, the revival of learning in Europe, as marking its close. Thus in round numbers, the M. A. may be assigned to the thousand years 500–1500. The Dark Ages (q.v.) is a term still more indefinite, perhaps best applied to a portion of the M. A., about 600–1000. The M. A. began with the rise of the Frankish on the ruins of the ancient Roman Empire, and with the commencement of civilization among the barbarous tribes which had taken possession of the former Roman provinces. During the M. A. the different nations of modern Europe were formed, and their political and social systems developed. It was a period of much superstition; in connection with which religious enthusiasm extensively prevailed, manifested in many great religious endowments, in magnificent ecclesiastical buildings (see **GOthic ARCHITECTURE**), in pilgrimages (see **PILGRIM**), in monasticism (see **MONACHISM**), and, above all, in the Crusades (q.v.). In the earlier parts of this period, the church was much occupied in the extension of its bounds in n. Europe, where heathenism still lingered; and the means employed were not always consistent with the spirit of Christianity. During the M. A., the hierarchy acquired enormous power and wealth, and the papacy rose from comparatively small beginnings to its utmost greatness. During the M. A., chivalry had its rise and decline; modifying, and in many respects tending to refine, the feelings and usages of society. Toward the close of the period, the revival of letters, the increase of knowledge, and the formation of a wealthy and leading class in society, distinct alike from the aristocracy and the peasantry, tended, even before the Reformation, both to the diminution of the power of the hierarchy and the decay of the feudal system.—See **FEUDAL SYSTEM: CHIVALRY: CRUSADES**. See Guizot's *Histoire de la Civilisation*; Rühls's *Handbuch der Geschichte des Mittelalters*; and Hallam's *History of the Middle Ages*.

MIDDLE BASS ISLAND: see **PUT-IN-BAY ISLANDS**.

MIDDLEBOROUGH, *mīd'l-būr-rūh*: town in Plymouth co., Mass.; in the s.e. part of the state, on the Namasket river; at the junction of the Cape Cod branch of the Old Colony r.r., the Boston to Provincetown, the Middleborough Taunton and Providence, and the Old Colony and Newport; 12 m. from Plymouth, 20 m. from Fall River, 34 m. from Boston. It is one of the oldest towns in the co., and popular as a summer resort because of its historic associations as well as its picturesque scenery. Before Lakeville was taken from its territory, it was the largest town in the state; it still comprises 60 sq. m., on

MIDDLEBURY.

both sides of the river, which flows in a winding course from several lakes 5 m. away, and empties into the Taunton r. Its 3 falls furnish excellent water-power, while the lakes abound in fish and afford numerous picnic grounds on their shores. The town comprises the thriving villages of North M. (Titicut), South M., The Rock, East M. (Eddyville), a number of smaller villages, and M. Four Corners, the central portion, known as M. Each of these villages has its churches, post-office, manufactures, etc. The town has several public halls, besides a town-house, containing a large hall, district-court room, a public library, a bank, and the town offices. About a mile from it is Muttok Hill cemetery, where lie buried some of the founders of the colony. M. was the seat of Peirce Acad., a Bapt. classical institution, founded 1808, which, however, has been discontinued, its prosperity having been fatally injured by the civil war. The system of graded public schools is in excellent condition. The town is regularly laid out, well lighted, and abundantly supplied with beautiful shade and ornamental trees, which have helped to make its drives so popular. The post-village of M. has 3 churches, 2 newspapers, a hotel, the Bay State straw-works, employing a large number of girls in its extensive factories and at their homes in the neighboring villages, several shoe factories, the Star woolen mills, manufactories of lumber, shovels, needles, trunks, boxes, and varnish, marble-works, and stores of various kinds. A considerable trade in horses from Vt. and Canada is carried on. Pop. (1890) 6,065; (1900) 6,885.

MIDDLEBURY, *mīdl-bēr-ī*: town, cap. of Addison co., Vt., beautifully situated on Otter creek at Middlebury falls; on the Rutland division of the Central Vermont r.r.; 35 m. s. of Burlington, 33 m. s.w. of Montpelier, 33 m. n.w. of Rutland. Surrounded by attractive mountain scenery, it has 6 fine marble quarries, whose white and variegated marbles are exported in considerable quantities. Its excellent water-power runs several cotton and woolen factories; it has also flour mills and iron foundries, besides manufactories of sashes, doors, and blinds, cotton, wool, paper, and leather. It contains several newspapers, 6 churches, 3 hotels, a national bank, a well-organized fire department, has good public schools and a free public library. Pop. (1900) 3,045. MIDDLEBURY COLLEGE, founded 1800, and under the control of the Congregationalists, has its seat here. In 1901-2 it had 11 profs. and instructors, 123 students, 24,895 volumes in the library, scientific apparatus valued at \$22,000, grounds and buildings valued at \$200,000, productive funds \$380,000, total income, excepting board and lodging, \$25,000. Ezra Brainerd, D.D., LL.D, was pres., and the college was open to both sexes.

MIDDLE LEVEL—MIDDLE PARK.

MIDDLE LEVEL: one of the three divisions of the remarkable district of 400,000 acres on the e. coast of England, known as The Fens, or **BEDFORD LEVEL** (q.v.), which, centuries ago, was converted into an unprofitable marsh by repeated incursions of the sea, together with obstructions to the outward flow of the rivers Nene, Cam, Ouse, Welland, etc. Vast operations have been carried on ever since the time of Charles I., by digging new channels and outfalls, and employing wind-mills and steam-engines to pump the water from the marshes and ponds into these artificial channels. In the M. L. (nearly the whole of whose 130,000 acres between the Nene and the Old Bedford river is about 15 ft. below high-water spring-tides) a notable irruption took place 1862, May 4. St. Germain's Sluice, at the confluence of the M. L. main outfall drain with the river Ouse, near the upper end of another artificial channel, gave way without warning. The rise of high-water spring-tide at that point was 19 ft., and the sill of the sluice was 6 ft. below low-water spring-tide. The tidal waters rushed up the opening, and ebbed and flowed throughout a distance of 20 m. After incessant exertions, the tidal waters were at length, June 19, effectually shut out by a strong coffer-dam, constructed by Hawkshaw, engineer. Another break in the embankment, about 4 m. distant, eight days after the first, admitted a rush of water which covered to a depth of 2 or 3 ft. 6,000 acres of fertile land, increased at successive high tides to 10,000 acres.

For riddance of the flooding waters, and for added outlet to the usual rivers, 16 enormous siphons were provided, to be placed *over* the coffer-dam: they were of cast iron, 3 ft. 6 inches internal diameter; they rested on the top of the dam, and on inclined frame-work supported by piles at the sides. The valves were so arranged that the siphons could be put in operation, either by exhausting the air or by filling them with water. When only six of the siphons were in position, they carried 50,000 gallons of water per minute over the dam.—For details see Hawkshaw's paper, before the Institute of Civil Engineers 1863.

MIDDLE PARK: one of the many fertile valleys, covering broad distances, in Summit co., Colo.; 7,500 ft. above sea-level; inclosed by spurs of the Rocky Mts., in the midst of the most varied and picturesque mountain scenery; 65 m. in length, 45 m. in breadth; about 3,000 sq.m. It is separated from North Park, directly n. of it, by one of the cross ranges of the main chain of the Rocky Mts. On the e. side of it is the Snow Range of mts., or continental divide, and lofty mountains surround it on every side, among which some of the highest and most prominent in the imposing landscape are Long's peak, Gray's peak, and Mt. Lincoln, each 13,000 to 14,000 ft. in height. The tract is watered and made fertile by the head-waters of the Grand river and the Blue river, which both flow w. to the Colorado. Most of the park has the appearance of a beautiful meadow, over whose

MIDDLESBOROUGH—MIDDLESEX.

carpet of green are scattered wild flowers of brilliant colors and in great profusion; a considerable part, however, is covered with dense forest. Game abounds throughout this region, including bears, elk, deer, antelopes, and mountain sheep; while the waters contain a variety of fish. Its main attraction to tourists, however, seems to be its mild and genial climate and very equable temperature; also its hot sulphur springs. These are near a branch of the Grand r., 45 m. from Georgetown, 60 m. from Central City, about 12 m. from the s. boundary of the park. They are much resorted to by sufferers from rheumatism, neuralgia, and skin diseases. A settlement for the accommodation of invalids is growing into quite a town around these springs. 27 m. from them is Grand Lake, a beautiful sheet of water full of trout and other game fish: it also is a resort of tourists.

MIDDLESBOROUGH, *mĭd'dlz-bŭr-rō*: important market-town, port, and parliamentary borough in the N. Riding of Yorkshire, at the mouth of the Tees, 48 m. n.e. from York. It is the centre of the n. of England iron manufacture. The town is of recent growth, and owes its origin as a port to its convenient position for shipment of coal brought by railway from the mines in s. Durham. In 1842 a commodious dock was constructed, recently much enlarged, and admitting ships of the largest tonnage.

On the discovery, 1840, of immense beds of ironstone, extending through the whole range of the Cleveland Hills, a portion of which are close to the town, the smelting of iron was speedily begun on an extensive scale, since marvellously increased. To smelting have been added iron-foundries, manufacture of rails, locomotive engines, tubes, boilers, etc.; chemical works, potteries, and ship-building also are carried on to a large extent. The town of M. was incorporated 1853, and constituted a parliamentary borough 1868. The Royal Exchange, built 1867, is a large and handsome building; in its spacious interior, the weekly iron market is held. The Corporation Hall contains the custom-house. The high school, built at a cost of £25,000, was given to the town by Mr. Pease, M.P. Albert Park, 72 acres, was given by Mr. Bolckow. A new dock, costing £120,000, was opened 1875; the new cattle market 1876. There are numerous churches, some of them handsome. The jubilee of M. was celebrated 1881; a statue of Mr. Bolckow, one of its founders and chief promoters, being unveiled. In 1831 M. was an obscure hamlet with 383 inhabitants: pop. (1871) parliament. borough 46,643; (1901) 91,317.

MIDDLESEX, *mĭd'l-sĕks*: the metropolitan county of England, in the s.e. of the island; bounded n. by Hertford, s. by Surrey; about 60 m. inland (westward) from the North Sea, with which it communicates by the river Thames. Next to Rutland, it is the smallest of English counties; only 180,136 statute acres; but its popula-

MIDDLE THIBET—MIDDLETON.

tion is second only to that of Lancashire. The surface is, on the whole, level, with gentle undulations. The Thames, which forms its s. boundary, and its affluents, are the only rivers of the county. Two of these, the Colne and the Lea, form respectively the w. and the e. boundaries of the county. It is traversed by the Grand Junction and Regent's canal, and the New river, an artificial cut intended to supply the capital with water. The soil is in general poor, with the exception of a tract of good fertile loam along the Thames. The land is occupied chiefly for grass and hay farms and market-gardens. The county town is Brentford. M. is subject to the City of London, and the whole co. is in the diocese of the Bp. of London. The county, which till 1832 sent 8 members to parliament, now returns 47 members. Pop. (1891) 542,894; (1901) 792,225.

MIDDLE THIBET: see LADAKH.

MID'DLETON: small manufacturing town of Lancashire, England, six m. n.n.e. of Manchester. The manufactures are chiefly cotton cloth and silks. Pop. (1861) 9,876; (1871) 14,587 (1891) 21,310.

MID'DLETON: small decaying market-town of Ireland, county of Cork, 13 m. by railway e. of the city of Cork. It contains a college founded 1696, noticeable as the place in which John Philpot Curran was educated, and still of considerable reputation. Pop. over 3,300..

MIDDLETON, *mīd'l-ton*, ARTHUR: 1681–1737, Sep. 7; b. S. C. He was educated in England, and returning, became prominent in colonial affairs. In 1704 he was appointed one of the commissioners to establish the Church of England as the state religion, became naval officer 1711, and was member of the council 1711–19. In the latter year he headed the movement which resulted in the overthrow of the proprietary government. He was elected pres. of the council 1721, was gov. of the colony 1725–31, and presided over the council until his death.—His father, EDWARD M. (1640–1700), b. England, inherited a large estate, spent some time at Barbadoes, and removed to S. C. in the early days of the colony. He received a valuable land grant, became a member of the council and an assistant judge, and was a champion of popular rights. D. in Charleston, S. C.

MID'DLETON, ARTHUR: 1742, June 26—1787, Jan. 1; b. S. C. He studied in England, at Harrow and Westminster, and graduated from Cambridge; travelled in Europe two years; 1763 returned to S. C., and the following year married a daughter of Walter Izard. In 1765 he became a member of the commons, a position which he held several years. He visited England 1768, returned three years later, and became a leader in political affairs; was a member of the committee of safety and of the provincial congress 1775, and followed his father as member of the continental congress 1776, and signed the declaration of independence. In 1778 he was

MIDDLETON—MIDDLETONITE.

elected gov. of S. C., but declined. He assisted, 1780, in the defense of Charleston, sustained heavy loss of property, was taken prisoner, exchanged, and returned to congress, where he remained until peace was declared, when he became member of the state senate. He was a skilful stenographer and preserved a record of many important debates. Under the name 'Andrew Marvell' he wrote able political documents. Died at Goose Creek, S. C.—His father, HENRY M. (1717–1784, June 13), was a wealthy planter and zealous patriot; speaker of the commons 1745–47, commissioner of Indian affairs 1755, member of council 1755–70, pres. of continental congress 1774, and of provincial congress of S. C. 1775–6. He was returned to the continental congress, but on account of ill health was unable to serve and was succeeded by his son.

MIDDLETON, CONYERS, D.D.: clergyman of the Church of England: 1683–1750, July 28; b. Richmond, Yorkshire. He studied at Cambridge, where he took the degree B.A. 1702, was elected a fellow 1706, and shortly afterward married a lady of fortune. His life was a series of bitter and, on the whole, not creditable controversies, though he is said to have been rather an agreeable person in private. His first and most formidable opponent was Richard Bentley (q.v.); afterward, his polemics were chiefly theological. The views that he advocated were generally such as to draw on him the imputation of being an 'infidel in disguise,' though some of them—such as, that the Jews borrowed some of their customs from Egypt, and that the primitive writers in vindicating Scripture found it necessary sometimes to recur to allegory—are now established beyond doubt; while his opinion, that the Mosaic narrative of the creation is not literal truth, has since M.'s day been adopted by many of the most learned clergy even of his own church. He seems not to have forsaken any essentials of Christianity, but to have lacked devoutness of temper, to have been too ready for controversy, and to have been naturally suspicious regarding all things that claimed to be supernatural. M. died at Hildersham, in Cambridgeshire. One of his writings was *The History of the Life of M. Tullius Cicero* (2 vols. 1741), a work interesting and valuable, but neither very impartial nor quite accurate. His celebrated *Letter from Rome, showing an exact Conformity between Popery and Paganism; or the Religion of the present Romans derived from that of their Heathen Ancestors* (1729), provoked the most violent indignation among Rom. Catholics, and is still read with interest. All his pamphlets, treatises, etc., were collected and published under the title *Miscellaneous Works* (4 vols. Lond. 1752–57), containing much that is of value.

MIDDLETONITE, n. *mīd'l-tŏn-īt*: a mineral resin found in the older Coal-formations, and occurring in layers, or in rounded pea-like masses, of a reddish-brown color—so called from *Middleton* collieries, near Leeds, where it was first discovered.

MIDDLETOWN.

MID'DLETOWN: city, county seat of Middlesex co., in s. Conn.; on the w. bank of the Connecticut river, about 30 m. above its mouth. The steamboats of the New York and Hartford line stop there daily; and it is a port of entry, its wharves having 10 ft. of water and admitting such vessels as can cross the bar at Saybrook. It is also a terminus of a branch of the New York New Haven and Hartford, and on the Connecticut Valley and the Boston and New York Air Line r.rs. It is built on ground gradually rising from the river and commanding a beautiful landscape; is regularly laid out, with wide streets intersecting one another at right angles; the buildings are chiefly of brick, and some of the private residences on the hilly environments of the city are delightfully located, surrounded by abundant shade-trees, and having exceptionally handsome grounds. The custom-house, of Portland freestone, and the courthouse are handsome structures, as are also several of the 16 churches. It has a graded public-school system, with a fine high school; a number of good hotels; 5 newspapers; a public library; and (1902, Sept.) 4 nat. banks (cap. \$894,300), 3 sav. banks, 1 state bank, and 1 private. In its suburbs are the state insane asylum and the state industrial school for girls. Its chief manufactures are cotton goods, britannia and silver-plated ware, hardware, tools, screws, guns, sewing-machines, pumps, etc. In its vicinity are deposits of felspar, columbite, gold, silver, and an old lead mine. An iron r.r. bridge connects it with Portland, on the opposite side of the river. M. is the seat of Berkeley Divinity School, belonging to the Prot. Episc. Church, established 1854, and having (1901-2) 6 professors and instructors, 12 students, 23,000 vols. in the library, productive funds (1899-00) \$423,949, grounds \$85,825; and of Wes. Univ. (q.v.). M. was incorporated as a city 1874. Pop. (1870) 6,923; (1880) 11,731; (1890) 9,013; (1900) 9,589.

MID'DLETOWN: city in Orange co., N. Y., on the Wallkill river, e. of the Shawangunk Mts., and w. of the highlands of the Hudson; 24 m. s.w. of Newburgh, 66 m. n.w. of New York; at the terminus of the N. J. Midland r.r., and at the junction of the Erie with the New York and Oswego Midland r.r. It is regularly laid out, with wide streets, well shaded, lighted, and sewered, and sidewalks of flagstone. It has a police force, a board of health, and a fire department. Its supply of water is from Lake Monhagan, 2 m. distant, its reservoir covering 80 acres, nearly 200 ft. above the town. In the s.w. part is Hillside cemetery, 50 acres in extent, beautifully laid out and well kept. M. has not less than 10 churches, a graded public-school system, Wallkill Acad. for girls, several private schools, a public library and reading-room, a number of newspapers, several public halls, an opera house, good hotels, and (1902, Sept.) two nat. banks (cap. \$200,000) and one sav. banks. Its blocks of business houses are substantial, its private residences handsome. The state homeopathic insane

MIDDLETOWN—MIDDLELING.

asylum here is capable of accommodating nearly 300 patients. Its chief industries are the manufacture of agricultural and dairy implements, woolen hats, blankets, saws and files, patent medicines, etc.; and it has an important country trade. Pop. (1870) 6,049; (1880) 8,494; (1890) 11,977; (1900)

MID'DLETOWN: town in Butler co., O., on the Miami river, 22 m. s. and w. of Dayton, 32 m. n. of Cincinnati. It has 11 churches, a high school (1902 Sept.) 2 nat. banks (cap. \$300,000), 1 private bank, and two newspapers. Transportation facilities are furnished by the Miami canal and two railroads. It has 7 paper mills, 2 tobacco factories, flour mills, a planing mill, and a scissors factory. A fine bridge crosses the river. Water is supplied by the Holly system. Pop. (1880) 4,538; (1890) 7,681; (1900) 9,215.

MIDDLETOWN: borough, in Dauphin co., Penn.; at the junction of the Susquehanna river and Swatara creek; on the Pennsylvania railroad; 9 m. s.e. of Harrisburg. It is in a rich agricultural country; has excellent water-power from Swatara creek; contains the American Tube and Iron Works, Susquehanna Iron Works, M. Car Works, Cameron Iron Furnaces, M. Furniture Co.'s factory, several planing mills, the Frey Orphan School, 2 newspapers, and (1890, Mar.) 1 national bank (cap. \$100,000), and 1 state bank (cap. \$50,000). It has had a large lumber trade for more than a century; the w. terminus of the Union canal was begun here 1790: and the first furnace for the manufacture of 'blister steel' in America was erected here 1793. M. was founded 1756, incorporated 1828. Pop. (1870) 2,980; (1880) 3,351; (1890) 5,080; (1900) 5,608.

MID'DLEWICH: small market-town of Cheshire, England, on the Grand Trunk canal, 20 m. e. of Chester. Salt is extensively made: boat-building is carried on, and brick-works are in operation. Pop. over 3,300.

MIDDLELING, a. *mīd'ling* [from *middle* (see **MID**)]: of middle rank or degree; neither high nor low; of middle average quality; of moderate capacity; mediocre. **MIDDLELINGS**, n. plu. *mīd'līngs*, the coarser part of the flour left in the dressing-machine; see **WHEAT**.

MIDGE—MIDIANITES.

MIDGE, n. *mīj* [Ger. *mücke*, a small fly—from *mucken*, to hum: Dut. *mug*, a gnat: Bohem. *maucha*; L. *musca*; F. *mouche*, a fly]: common name of many species of small dipterous insects, of family *Tipulidæ*, much resembling gnats, but having a shorter proboscis. Their larvæ are aquatic; the perfect insects are often very annoying to human beings and to cattle. The little pink-colored tortuous worm known to anglers as the *Blood-worm*, frequent in water-barrels and in the mud near the edges of ponds and ditches, is the larva of a species of *M.* (*Chironomus plumosus*), a little larger than the common gnat, abundant in some marshy situations. The larva is much sought by birds and is a very tempting bait for fish. The pupa is cylindrical, with respiratory organs on the sides of the thorax. When the insect is ready to quit its pupa case, it rises to the surface of the water, and there remains suspended for a short time; the perfect insect, when it has issued from the case, also stands for a short time on the surface of the water. The genus is remarkable for the long hairs with which the antennæ of the male are furnished.—Another genus of Midges (*Simulia*) contains many species most tormenting to men and cattle, by entering the ears and nostrils, and alighting on the eyelids. They swarm on marshes and damp heaths in the warmer months. But none of them is nearly so mischievous as a species (*S. columbaschensis*) on the banks of the Danube, sometimes in such dense swarms that horses and cattle are suffocated by the numbers which enter the wind-pipe.—The common gnat is popularly termed Midge.

MIDGET, n. *mīj'ët* [dim. of *midge*]: very diminutive creature: Canadian name for the sand-fly.

MIDHURST, *mīd'ërst*: market-town of England, in Sussex, on the Rother, a navigable tributary of the Arun, 50 m. s.w. of London. Here are the ruins of an old castle of the De Bohuns, lords of M.; and within half a mile e. of the town stood Cowdry House, seat of the Montagues, which was burned 1793. At the grammar school, founded 1672, Richard Cobden was educated. Pop. (1861) 6,405; (1871) 6,753; (1881) 7,277.

MIDIANITES, *mīd'ī-an-īts*: an Arab race, descended, according to Scripture, from Midian, son of Abraham by Keturah; thus distant kinsmen of the Israelites. They occupied the greater part of the country between the n. side of the Arabian Gulf and Arabia Felix, as far as the Plains of Moab. Others more civilized (if not, indeed, of Cushite origin) dwelt in the vicinity of the Sinaitic peninsula, and carried on a trade, particularly with Egypt. To the latter, we may presume, belonged Jethro, priest or 'sheik' of Midian—father-in-law of Moses. The main body of the M., in later times, were very troublesome neighbors to the Israelites till Gideon's great victory over them. They appear as a strong Bedouin confederation, given to invasion and ravage. Their national god was Baal-Peor.

MID-LOTHIAN—MIDRIFF.

MID-LO'THIAN: see EDINBURGHSHIRE.

MIDNAPUR, or MIDNAPUR, *mĭd-na-pôr'*: chief town of the dist. of M. in India; on the n. bank of the Kasái river; about 65 m. s.w. of Calcutta. Its location is healthful and dry; it is well laid out, and supplied with abundant and good water. There is a large bazaar in M., in which are the public offices. An excellent training-school has been founded by the American missionaries there, which has been very successful among the natives, and has established village schools in the vicinity. The mission has also a printing-press, from which have been issued some of the earliest and most important works on the Santal language. The chief industries are the manufacture of copper and brass utensils, indigo, and silk. Pop. (1872) 31,491.

The *district* of M. is in s.w. Bengal, forming part of the province of Orissa; 5,082 sq. m.; pop. (1872) 2,540,963: largest river, the Hooghly.

MIDRASH, *mĭd'răsh* [Heb. *darash*, to search, explain the Scriptures]: general name given to the free exposition of the Old Testament, with the historical, legendary, exegetical, didactic, and homiletic comment thereon, which, for about 1,500 years after the Babylonian exile, formed the centre of all mental activity, both in and out of the schools, among the Jews. The prohibitions and ordinances in the Mosaic records, to which a precise meaning was not, in all cases, attached, were, according to certain hermeneutical rules, specified and particularized, and further surrounded by traditional ordinances and inhibitions: Halacha (q.v.) = rule by which to go, or the binding, authoritative, civil, and religious law. The chief codes of this are the Mishna (q.v.), Gemara (q.v.), Sifra (amplification of Leviticus), Sifri (on Numbers and Deuteronomy), and Mechilta (on a portion of Exodus). Another branch of the M., however, is the Haggada (q.v.), a kind of free poetical homiletics on the whole body of the Old Testament (the Halacha being chiefly confined to the Pentateuch). Haggada was more noticeably ethical and consolatory. The chief collections of that part of the M. known as Haggada are Midrash Rabba, A.D. 700–1100 (on Pentateuch and Megilloth), and Pesikta (700), the extracts from which (Jalkut, Pesikta Rabbati, Sutarta, etc.) only are known, the original itself never having been printed. As a whole the M. is of great value, inasmuch as a search in its unattractive mass reveals numerous lexical and grammatical hints, and historical, topographical, and chronological notices; also remarkable suggestions in logic, metaphysic, theology, and in ethnography and natural sciences.

MIDRIFF, n. *mĭd'rĭf* [AS. *hrif*, entrails: Dut. *middel-rift*, the diaphragm: OH. *hreve*, the belly]: in *anat.*, the diaphragm; a muscular partition which separates the cavity of the chest from the belly.

MIDSHIPMAN—MIDWIFERY.

MID'SHIPMAN: ninth and lowest grade of officers in the U. S. navy capable of regular promotion. They must be graduates of the Annapolis naval acad., where they are called 'cadet midshipmen,' until the warrant of M. is conferred on them, and they take rank in the navy in the order of merit. Their pay while on sea duty is \$800 a year. After 2 years of actual service at sea, a M., if he can produce a favorable recommendation from his commander, is entitled to an examination for promotion before a board consisting of 3 captains and 2 commanders. Having passed this examination on the practical branches of seamanship, including naval tactics, practical navigation, gunnery, and the steam-engine, he becomes an ensign, and can be promoted to the higher grades of the service. There are about 100 M. in the U. S. navy. In the British navy, the M. is more a naval apprentice under instruction than an actual officer. After 3½ years' service as M., if he passes two qualifying examinations, and is not under 19 years of age, he becomes a sub-lieut., and is eligible for promotion to lieut. and the higher grades.

MIDST, n. *mīdst* [superl. of **MID**, which see]: the middle; the very centre: **AD.** in the middle. **IN THE MIDST OF US** (colloq.), among us, as neighbors, fellow-citizens, or fellow-countrymen. **IN THE MIDST OF**, among; involved in; in the thickest of. *Note.*—**IN OUR MIDST**, **IN THEIR MIDST**, instead of 'in the midst of us,' 'in the midst of them,' are improper.

MIDWIFE, n. *mīd'wīf* [**AS.** *mīd*, with, together with; *wīf*, woman, wife]: woman who assists women in childbirth. **MIDWIFERY**, n. *mīd'wīf-rī*, profession of a midwife; art of assisting women in childbirth; obstetrics.

MID'WIFERY: department of medical science which concerns itself with parturition and its allied subjects. Writers who prefer words derived from Latin and Greek roots have substituted for it *Obstetrics* [Lat. *obstetrix*, a woman who stands near, a midwife], and *Tocology* [Gr. *tokos*, childbirth], or *Gynecology* [Gr. *gynē*, woman]. For a male practitioner in this line of the medical art, the French name *accoucheur* is used; and recently an obnoxious new verb, *to accouch* [Fr. *accoucher*, to deliver a woman], has made its appearance in medical literature. **M.**, as a branch of medical science, is understood to include the study of the anatomy of the parts of the female body concerned; the doctrine of conception and of sterility, and the signs and duration of pregnancy; parturition in all its varieties; and the diseases peculiar to the puerperal state. Into the details of a subject so extended and complex, this article does not enter.

In a vast majority of cases the labor in parturition is what is called 'natural'—that is, the child presents itself in the normal position, and unaided nature completes the delivery within 24 hours with safety to mother and child. Dr. Smellie calculated that 990 in 1,000 are 'natural' labors; and the later statistics of Dr.

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Collins, based on 15,850 cases, give a similar result—983 in 1,000. 'Unnatural' labor arises either from malformation, disease, or weakness on the part of the mother, or from abnormal conditions of the child; and manual or instrumental aid becomes necessary to prevent the labor from being dangerously prolonged, or—in extreme cases—to render delivery at all possible. Of instrumental applications, by far the most important and frequent is that of the Forceps (q.v.), intended not to injure either mother or child. In 123,295 cases of labor attended by British practitioners, there were 342 forceps cases, or 1 in 360; of these, about 1 in 21 proved fatal to the mother, while 1 child in 4 was lost. In Craniotomy, the head of the child is intentionally destroyed, with a view to save the life of the mother, the death of both being otherwise inevitable. This operation is not frequently resorted to; it proves fatal on the average to about one mother in $5\frac{1}{3}$. Also, see CESARIAN OPERATION.

History.—From all the passages in the Scriptures where M. is referred to, it is plain that women were the only practitioners of this art among the Hebrews and the Egyptians (see Gen. xxxv. 17; xxxviii. 28; Ex. i. 15–21), and it is equally certain that the Greeks and Romans confided this branch of medicine to women. Phanarete, the mother of Socrates, was a midwife; and Plato explains the functions and mentions the duties undertaken by these women. The Greek and Roman physicians were not ignorant of M., for Hippocrates refers to the necessity of turning the child in certain cases, though his doctrines on this point, as also on the management of the placenta, are replete with danger; and Celsus, nearly four centuries later, treats of the mechanism of labor with great clearness. A gradual increase in the knowledge of this subject may be traced in the writings of Aëtius, and of Paulus Ægineta, who advocates the doctrine of craniotomy in certain cases. Rhazes seems to have been the first to advocate the rupture of the membranes, when, by their toughness, they impede labor; and Avicenna gave the first description of an instrument partially resembling the more modern forceps.

At the commencement of the 16th c., Eucharius Rhodion published a little book, which soon acquired celebrity. It was translated from the original High-German into Latin, French, and English, and is remarkable as the first book published on this subject in England. Its title is, *The Byrth of Mankynde, otherwise named the Woman's Book*, by Thomas Raynold, Physician (London 1540), and it contains no external evidence that it is a mere translation. In 1573 Ambrose Paré published a small work, in which he showed that foot-presentations were not dangerous, and that in malpresentations it was better to deliver by the feet than to attempt to bring down the head.

In the early part of the 17th c., the *sage-femme* (French term corresponding to English midwife) of Marie de

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Medicis published a collection of observations on M. About this time (probably about 1640), Dr. Paul Chamberlen, English physician, invented the forceps with separate blades, such as are now used. The exact date of this important invention is not known, but 1647 Dr. Peter Chamberlen published a pamphlet entitled *A Voice in Rhama*, in which he speaks of his father's (Dr. Paul Chamberlen) discovery for the saving of infantile life. Hence the forceps must have been invented in the first half of the 17th c. The Chamberlen family (the father and three sons) did not, however, publish their discovery, considering that they had a right to use the secret in the way most to their own advantage; and the exact nature of their instruments was not known till 1815, when the tenant of a house near Maldon, in Essex, England, where Dr. Peter Chamberlen, one of the sons, had resided more than a century previously, accidentally discovered a concealed space, in which were, *inter alia*, a collection of obstetric instruments, including a double-bladed forceps and a vectis, which are now in the possession of the London Medico-Chirurgical Society. Therefore, though Chamberlen's celebrated *arcanum* was doubtless the double-bladed forceps, he seems to have been the inventor also of the vectis or lever. In 1668 Mauriceau's Treatise appeared, which ran through seven editions, and was for a long time the standard work on the subject. He gives a very full account of the process of labor; and his book having been translated into English, 1672, by Hugh Chamberlen, became widely known in Britain. This seems to have been the time when medical men in general began to engage in the practice of M.; Harvey, the Chamberlens, and others, taking it up in England; while La Vallière, mistress of Louis XIV., did much to establish the practice in France, by employing Julian Clement, surgeon of high reputation, in her first confinement 1663.

The last point requiring notice in the history of midwifery in the 17th c. is the discovery of the use of ergot of rye in accelerating parturition. In 1688 Camerarius stated that midwives in parts of Germany were in the habit of employing it for this purpose; but not till 1774 is further reference found to the use of this drug.

In the early part of the 18th c., different varieties of forceps, closely resembling Chamberlen's instrument, were invented by Giffard, Chapman, and others; Chapman being, as it is believed, the first public teacher of M. in London. About the middle of this century lived Sir Richard Manningham, who applied himself to this branch of the profession, and established a small hospital for the reception of parturient women, first of the kind in the British dominions. M. was by this time fully recognized as a branch—though then and long subsequently considered as the lowest branch—of medicine. The names of Smellie, William Hunter, Denman, and Bland in England, and of Astruc and Baudelocque in

France, are well known as promoters of various departments of the art of M. toward the close of the 18th c.

In the 19th century, the art has steadily progressed. The by-laws precluding practitioners in M. from the fellowship of the London College of Physicians, and equally offensive rules in other institutions, have been repealed; there are professors of or lecturers on M. in all British medical schools (excepting at the universities of Oxford and Cambridge), and in all leading American medical schools; and knowledge of this department of medicine is now required from every candidate for the medical profession. And not only are the members of the medical profession compelled to be as well versed in M. as in medicine or surgery, but the ignorant midwives of past times are now largely replaced by comparatively well-educated nurses, with diplomas, certifying that they have regularly attended lectures on M., and have taken personal charge of a certain number of labors, under superintendence of a qualified teacher. And that properly educated women are capable of undertaking all the responsibilities of this department of practice is shown by such cases as those of Mesdames Boivin and Lachapelle, who (to use the words of Prof. Velpeau), 'although the pupils of Baudelocque, were not afraid to shake off, to a certain extent, the yoke of his scientific authority, and whose high position and dignity form the starting-point of a new era for the science of obstetrics in Paris.'

MIEN, n. *mēn* [F. *mine*, air, look—from It. *mina*, countenance—from mid. L. *minārē*, to lead: W. *min*, the lip or mouth: comp. Gael. *mèinn*, expression, the countenance]: the whole external appearance; aspect; air; manner.—SYN.: look; demeanor; countenance; deportment.

MIERIS, *mē'ris*, FRANS VAN, the elder: 1635, Apr. 16—1681, Mar. 12; b. Leyden, Holland: Dutch painter. There is some question as to the correctness of the date given for his birth. He received his first instruction from Abr. Toorne Vliet, a famous Dutch designer; afterward studied under Gerard Dow, who called him the prince of his pupils. He applied himself chiefly to genre painting and occasional portraits. His pictures of domestic life are accurate in drawing and rich in color. In the treatment of stuffs and textures, he was superior to Dow himself; his representation of velvet and satin and other rich materials was wonderfully close; while the same accuracy of design, richness of coloring, and exquisite finish distinguish his portraits, the most famous and highly prized of which was his portrait of the wife of Cornelius Plaats. All his pictures are rare and command very high prices. Perhaps the most of them are in the gallery at Florence. He was a man of extravagant habits, and died a prisoner for debt at Leyden.

MIFFLIN—MIGNARD.

MIFFLIN, *mĭflĭn*, THOMAS: 1744–1800, Jan. 20; b. Philadelphia; of Quaker parentage. He was educated at the Univ. of Pennsylvania; 1765 went to Europe; and on his return entered into business partnership with his brother. In 1772 he began public life as representative from Philadelphia in the colonial assembly; and 1774 was delegate to the first continental congress. He was made maj. in one of the first Philadelphia regiments; and 1775, June, became col., and went to Cambridge with Washington, as his first aide-de-camp. He was rapidly promoted to quartermaster-gen., to adj.gen., and, 1776, May 16, to brig.gen. At the battle of Long Island he rendered distinguished service, covering the army's retreat, and afterward, by his stirring appeals to the people of Penn., raised considerable reinforcements for the continental army prior to the battles of Trenton and Princeton. In 1777 he was made maj.gen., but, becoming dissatisfied, became a prominent member of the famous 'Conway cabal' in opposition to Washington, after the failure of which he resigned his commission. In 1782 he was elected to congress, and 1783 was its pres.; 1785, he became a member and speaker of the Penn. state legislature; 1787, delegate to the national constitutional convention; 1788, succeeded Franklin as president of the supreme executive council of Penn.; 1791–1800 was gov. of the state. He died at Lancaster, Penn.

MIGHT, v. *mīt*: pt. of **MAY**, which see.

MIGHT, n. *mīt* [Goth. *mahts*; Ger. *macht*; Swiss, *mucht*; Bohem. *moc*, might, power (sec **MAY**)]: strength, force, or power in general; ability. **MIGHTY**, a. *mīt'ī*, strong; powerful; very forcible; very great or eminent; momentous: AD. in very great degree; very. **MIGHTILY**, ad. *-ī-lī*, powerfully; efficaciously; vehemently; in a great degree. **MIGHTINESS**, n. *-nēs*, power; greatness; title of dignity. **MIGHT AND MAIN**, utmost effort; highest degree of strength.—**SYN.** of 'mighty': valiant; impetuous; violent; enormous; bulky; vast; forcible; efficacious; important.

MIGNARD, *mĕn-yâr'*, PIERRE: 1610–1695; b. Troyes, France. He studied painting first under Simon Vouet; 1630 went to Italy, where in the 22 years of his residence there he became so famous that he was summoned to Paris to paint a portrait of the king. He refused to enter the Academy, and opposed Le Brun, its head, becoming chief of the opposition, which kept him from painting any of the great public works, though his decoration of the cupola of the Val de Grace, 1664, was famous. He applied himself chiefly to portrait-painting, becoming the chief portrait-painter of the century, and nearly all the celebrities of his time sat for him. Le Brun died 1690, and M. succeeded him. Many of his works have been engraved. While about to begin work on the cupola of the Invalides, at Paris, he died,

MIGNET, *mĕn-yā'*, FRANÇOIS AUGUSTE ALEXIS: French historian: 1796, May 8—1884, Mar. 24; b. at Aix in Provence. He studied law in his native city together with Thiers, and went to Paris 1821, to enter on a literary life. He found employment in writing for the public journals, and having given lectures on modern history, which were received with great approbation, he was induced to write *Histoire de la Révolution Française* (2 vols. Par. 1824; 10th ed. 1840), in which that great event is regarded less in its moral than its philosophical aspects. It has therefore been reproached with leading to fatalism. His style is brilliant, but academic. After the revolution of 1830, he became a counselor of state, and keeper of the archives of the ministry of foreign affairs; but lost these offices 1848, after which time he lived in retirement. He edited *Négociations relatives à la Succession d'Espagne sous Louis XIV.* (4 vols. Par. 1836-42), to which he prefixed a masterly historic introduction. Among his later works are *Histoire de Marie Stuart* (2 vols. Par. 1851), and *Charles Quint, son Abdication, son Séjour et sa Mort au Monastère de Yuste* (1854); *Eloges Historiques* (1864); and *Rivalité de François I. et de Charles V.* For a *Histoire de la Réforme, de la Ligue et du Règne de Henri IV.*, he is said to have collected hundreds of vols. of manuscript correspondence.

MIGNONETTE, or MIGNONNETTE, n. *mĭn'yŏn-nĕt'* [F. diminutive of *mignon*, darling; literally, 'little darling'], (*Reseda odorata*): plant of nat. order *Resedaceæ*, native probably of n. Africa (including Egypt) and of Syria; in universal cultivation for the delicious fragrance of its flowers. It is, according to circumstances and the mode of cultivation, an annual or a perennial, and even half-shrubby plant, with lanceolate entire or trifid leaves, and erect terminal racemes of small whitish flowers, which have the calyx 6-parted and as long as the corolla, the capsules 3-toothed. In the ordinary culture, M. is usually sown in spring, and takes care of itself. It is seen during summer in almost every garden, and during winter in almost every green-house; it is often cultivated in flower-pots in apartments, and perhaps no flower is more common in boxes placed outside of windows in towns. Yet it was introduced into England from Paris 1742 (according to a ms. note in the library of Sir Joseph Banks); and Lord Bateman brought it from the Royal Garden at Paris 1752, when it had not been long known in France. The same year it appears to have been sent from Leyden to Chelsea. It rapidly became a universal favorite throughout Europe, and later in the United States. What is called *Tree M.* is not even a distinct variety, but merely the common kind trained in erect form, and prevented from early flowering by pinching off the ends of the shoots. A handsome double-flowered variety also has been obtained.—Weld (q.v.) belongs to the same genus,

MIGRAINE—MIGRATIONS OF ANIMALS.

MIGRAINE, n. *mī'grān* [a corruption of *hemicrania*]: the brow-ague; a painful disorder generally on one side of the forehead: see **MEGRIM**.

MIGRATE, v. *mī'grāt* [L. *migrātus*, removed from one place to another: It. *migrare*]: to remove from one country to settle or reside in another. **MI'GRANT**, n. *-grānt*, one who or that which migrates, as a migratory bird or animal: **ADJ.** migrating, migratory. **MI'GRATING**, **imp.** **MI'GRATORY-CELLS**, n. term applied under certain circumstances to the colorless corpuscles of the blood. **MI'GRATED**, pp. **MIGRATION**, n. *mī-grā'shūn* [F.—L.]: the act of removing from one country to another; the instinctive periodical change of abode from one climate to another, common to many species of animals, especially birds. **MIGRATORY**, a. *mī'grā-tēr-ī*, accustomed to migrate; passing from one climate to another; roving.

MIGRA'TIONS OF ANIMALS: movements of animals in a definite direction, in search of food or (in the case of fishes) of a fit place for spawning; apparently always guided by an instinct operating on all, or nearly all, the individuals of a species. These M. are not to be confounded with the mere diffusion of animals over a more or less extended area, nor with the distribution of species (see **GEOGRAPHICAL DISTRIBUTION OF PLANTS AND ANIMALS**).

Among mammals, such migrations are comparatively rare. The most remarkable instance is that of the Lemmings, which at no definite epochs, but generally once or twice in a quarter of a century, traverse Nordland and Finmark in vast hosts, ending their career in the Western Ocean, into which they enter, and come to a suicidal end; or, taking a direction through Swedish Lapland, are drowned in the Gulf of Bothnia. M. Martins, member of the great scientific Scandinavian expedition, seems to doubt the generally entertained view of these animals casting themselves into the Western Ocean, and believes that most of them perish from the cold in crossing the rivers, while many are killed by dogs, foxes, and a species of Horned Owl (*Strix brachyotos*), which, in large numbers, always accompanies these emigrations.

According to Gmelin, the Arctic Fox (*Vulpes lagopus*) always accompanies the lemmings in such numbers that, on this ground, it is entitled to be considered a migratory animal; but independently of these special migrations, it is stated by Sir James Ross that 'the young generally migrate to the southward late in the autumn, and collect in vast multitudes on the shores of Hudson's Bay; they return early the following spring to the northward, and seldom again leave the spot they select as a breeding-place.'

The Spring-bok (*Antidorcas Euchore*) is accustomed to make pilgrimages from one spot to another in the vast plains of s. Africa. Herds of many thousands are led

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by their chiefs in these migrations, and the wonderful density of the moving mass may be imagined from the fact that a flock of sheep has been inextricably entangled and carried along without possibility of escape. Want of water is said to be the cause of these migrations, but Dr. Livingstone thought that there must be other causes.

The occasional incursions of wolves, in very severe winters, into districts in which they are not commonly found, and the long excursions of large groups of monkeys (*Entellus* and *Rhesus*), hardly fall within the scope of this subject.

Many of the cetacea are probably migratory. 'The migrations of the Porpoise (*Phocæna communis*) appear'—says Marcel de Serres in his prize-essay, *Des Causes des Migrations des divers Animaux*, p. 63—'to be as periodic as those of certain species of birds. During the winter, they constantly proceed from n. to s.; and when they feel the warmth of summer, they turn northward. Thus, they are common in summer in Greenland, while they are rare on our own (French) coasts, where they abound in winter.'

The number of species of birds that periodically migrate is so great that space fails here for a list of them. Marcel de Serres, in the work above quoted, gives a *Tableau de Epoque des Passages des Oiseaux*, which extends over nearly 100 pages: see BIRDS OF PASSAGE. Desire for suitable temperature and search for proper food are the apparent causes stimulating birds to these migrations; and in most instances, especially in the case of insectivorous birds, the food is intimately associated with the temperature.

The migrations of many species of fishes are as remarkable for their regular periodicity as those of birds. In some cases, fishes produced in fresh-water streams migrate to the ocean, and after spending some time in salt water, return (generally, with singular instinct, to their own birthplace) to fresh water to propagate their species. Some of these fishes—e.g., the Lamprey (*Petromyzon marinus*)—spend most of their lives at sea, and others—e.g., the salmon—in fresh water. The remarkable migrations formerly, but erroneously, supposed to be made by herrings, are noticed in the article on that fish. Many fishes of the same family as the herring, the *Clupeidæ*—as, for example, the sprat and pilchard—leave the deep sea for shallow water during the spawning period, when they approach the coasts in vast shoals. All such migrations as these seem due mainly to a reproductive impulse. See FISHES: LAND-CRAB.

Among insects, the Locust (*Locusta migratoria*) is most remarkable for migrations. These insects are probably produced much more abundantly some years than others, and as in such years their birthplace cannot afford them sufficient vegetation, they are led to migrate in search of food. Some idea of the occasional extent of their wanderings may be formed from the fact that, in

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the early part of 1810, myriads of locusts appeared in Bengal, whence they proceeded westward, completely across the great Indian peninsula, to Guzerat and the neighboring provinces, whence they pursued their course southward toward Bombay, the whole period of their migration extending over between two and three years; while, in relation to their numbers, Capt. Beaufort calculated a swarm that appeared at Sardis, in Asia Minor, 1811, at more than 168,000,000,000,000.

MIGUEL, *me-għēl'*, Dom MARIA EVARIST (known usually as DON MIGUEL): pretender to the throne of Portugal: 1802, Oct. 26—1866, Nov. 14; b. Lisbon; third son of John VI. of Portugal, and uncle of Dom Pedro II., lately emperor of Brazil. He spent his early years in Brazil, unrestrained and uneducated. When he returned with the royal family to Portugal 1821, he could neither read nor write, and showed no talent for anything but fencing. He joined his mother, Charlotte Joachime of Spain, in her plots for the overthrow of the constitution and the establishment of a despotic govt.; part of the scheme being, that his weak father should be either formally deposed, or virtually deprived of power. The aged Marquis of Loulé, faithful servant of the king, having been removed by assassination, M., as Infant-generalissimo, caused the ministers to be arrested, 1824, Apr. 30, and his father to be closely watched in his palace; but the plot failed, and M. and his mother were banished. He led for some time a remarkably wild and profligate life in foreign countries. After the death of his father 1826, the queen's party set forth a claim to the throne on his behalf, as his elder brother, Dom Pedro I., was emperor of Brazil; and 1826, May 2, Pedro resigned the crown of Portugal in favor of his eldest daughter, Donna Maria da Gloria, proposing that her uncle M. should be her husband. and regent of the kingdom till her majority; to all of which M. agreed. But Queen Joachime's party had everything prepared for the restoration of absolutism. M. was declared king of Portugal. War ensued, and at first M. was victorious. He carried into full effect the principles of his party by a system of most severe repression of liberalism, and signalized himself by extreme tyranny of every kind, while his own life was one of wildest excess. In 1832 Dom Pedro took Oporto, and, his arms gradually prevailing, M. was obliged to sign a capitulation at Evora, 1834, May 26, by which he resigned all claim to the throne of Portugal, and agreed to retire altogether from the country. But scarcely had he been conveyed to Genoa, when he protested against this deed, and consequently all his estates in Portugal were confiscated, and an annual pension which had been secured to him was stopped. He went to Rome, where the papal govt. acknowledged him as rightful king of Portugal, but with no result. Laterly he lived at the castle of Bronnbach, in Baden, where he died.

MIHRAB, n. *mē'rāb* [Arab. a praying place]: ornamental recess or alcove in the centre of the exterior wall of a mosque, having the mimbar or pulpit to the right. It always marks the direction of Mecca, and the people pray in front of it. In it a copy of the Koran is kept. A similar place is found in Jewish synagogues, pointing toward Jerusalem, and containing a copy of the Law.

MIKADO, n. *mī-kā'dō*: common title of the emperor of Japan. The term, said to mean honorable gate, or grand place, was formerly applied to the palace of the sovereign, but for a long period has been used to designate the official head of the nation. The M. claims to have descended from the divine beings who created the world. He has no family name, does not take that of any previous M., and the name by which he is known in history is selected after his death. He can have one wife and 12 concubines, and there are four imperial families from either of which a child may be selected for adoption by the M., and thus be brought into the line of succession. The first M. began to reign about B.C. 660; and 123 rulers, of whom 11 were females, have occupied the throne; and it is claimed that during the 2,500 years the line of descent has been unbroken. The present M., MUTSUHITO (q.v.), b. 1852, was crowned 1868. He at once abandoned the ancient policy of seclusion, received representatives of various Christian nations, and in 1869 removed his residence to Yedo, changing its name to Tokio. See JAPAN—Government, History.

MIKANIA, *mī-kā'nī-a*: genus of plants of nat. order *Compositæ*, nearly allied to *Eupatorium* (q.v.). The heads of flowers are 4-flowered, and have four involueral leaves. *M. officinalis* is a Brazilian species, with erect stem and heart-shaped leaves, abounding in a bitter principle and an aromatic oil, and valuable as a tonic and febrifuge. *M. Guaco* and *M. opifera*, also natives of warm parts of S. America, are among the plants which have high reputation—deserved or undeserved—for the cure of snake bites. They are twining herbaceous plants. *M. Guaco* is remarkable for large indigo-blue spots on the under side of its ovate leaves. The mode of using this plant, which is one of those called GUACO, or HUACO, by the Indians, is by dropping the juice of the fresh leaves into the wound made by a serpent; or little cakes are formed of the bruised plants, which are said to retain their power a long time. The subject requires investigation.

MIKLOSICH, *mīk'lo-shīch*, FRANZ: Slavist, most eminent for learning: b. 1813, Nov. 20, at Luttenberg, in the Slavie part of Styria. After studying law at the Univ. of Grätz, he went 1838 to Vienna to practice as advocate; but 1844 obtained a situation in the Imperial Library; 1850 was appointed prof. of Slavie in Vienna. His principal works are—*Radices Linguae Palæoslovenicæ* (Leip. 1845); *Lexicon Linguae Palæoslovenicæ* (Vienna 1850); *Vergleichende Grammatik der Slaw, Sprachen*

MIKLOS—MILAN.

(4 vols. 1852-74), a work which has done for Slavic what Grimm and Diez have done for the German and the Romance languages. Other works are *Die Bildung der Slaw. Personennamen* (1860), and *Die Zigeuner Europa's* (1872-78).

MIKLOS (St.) TOROK, *sěnt mē-klōsh' to-rōk'*: town of Hungary, county of Heves, near the Theiss, about 70 m. s.e. of Pesth, with which it is connected by railway. The people are employed chiefly in rearing horses and cattle, and in fishing. Pop. over 16,000.

MIKNAS, *mīk'nas*, or MEQUINEZ, *mēk'e-nēz*, or MEKNAZA: town in the province of Fez, in Morocco, 38 m. w. by s. from the town of Fez; in a fertile valley near the Sebu. It is surrounded by triple walls and a moat; is neat and well built, and contains the finest imperial palace in Morocco. This vast pile, erected by the Sultan Muley Ismail, is of marble, and the surrounding grounds are laid out in gardens, said to be the most beautiful in Morocco. M. is the summer residence of the sultan. There is an extensive trade in native produce. The chief manufactures are of painted earthenware and leather. Pop. unknown, as estimates vary from 15,000—55,000.

MILAN, *mīl'an*: province of Italy, in w. part of Lombardy; bounded n. by Como, e. by Bergamo, s. by Cremona and Pavia, w. by Pavia and Novara; 1,155 sq. m. The surface is hilly in the n., with level plains in the s. The soil is fertile, though low and marshy along the Ticino river, which separates it from Piedmont on the n., and the Addio, Lambro, Olona, and other branches of the Po which drain the country. Railroads traverse it to Venice, Como, Parma, and Turin. Monza, on the Lambro river, 10 m. n.e. of Milan, is, besides Milan, the only considerable town, having about 20,000 inhabitants and a famous old cathedral. The portraits of all the Lombard sovereigns are preserved in this town. The surface of the province is kept very productive by being intersected with many canals for irrigating purposes; it affords fine pasturage for superior cattle, and produces fruit, corn, rice, silk, etc. The province has many flourishing villages, hamlets, farms, and country residences. It is divided into 5 districts now; under Austrian dominion it had 15, with an area of only 746 sq. m. The present districts are Abbiategrasso, Gallarate. Lodi. Milan. and Monza. Pop. (1891) 1,114,991; (1901) 1,442,179.

MIL'AN (Ital. *Milano*): second in size of Italian cities (after Naples and before Rome); cap. of the province of M.; 25 m. s. of the Alps at Como; 390 ft. above sea-level, on the river Olona, in the centre of the great plain of Lombardy. Pop. (1871) city 199,009; commune 261,985; (1881) city 214,004; with suburbs 295,543; (1901) commune 491,460. Being on the line of the chief routes of the central Alps, it derives great commercial advantages, while its fine canal-system opens for it communication with the principal rivers of Italy. The *Naviglio Grande*, or Grand Canal, connects M. with the Ticino, and

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the Martesana canal with the Adda. The city, almost circular, is encompassed on three sides by walls and low ramparts; it has a circuit of about $7\frac{3}{4}$ m., and is entered by 10 gates. Notwithstanding its great antiquity, M. possesses but few remains of its early splendid structures, in consequence of the many calamitous wars by which it has been ravaged. Modern M. is one of the most opulent and populous cities of Italy; its best streets are regular, wide, and well paved, and kept with scrupulous care; the dwellings are commodious and tasteful, though of less imposing character than the great feudal Tuscan houses. M. abounds in churches worthy of note: of these, the principal is the famous Gothic cathedral, the *Duomo*, which, with the exception of St. Peter's in Rome, is the most magnificent ecclesiastical structure of Italy. It has a façade of white Carrara marble, and is adorned by 106 pinnacles and 4,500 statues, besides a variety of carvings of unsurpassable beauty. In form, it is a Latin cross, length 485 ft., breadth 252 ft. The height of the dome is 355 ft. Its foundation was laid 1386 by Gian Galeazzo Visconti, and during its erection many of the greatest European architects contributed designs for its embellishment. Within it, Napoleon was crowned king of Italy 1805. The Church of St. Ambrose (founded, 4th c., by Ambrose [q.v.] great Bp. of M.) is the most ancient in M., containing inscriptions, sarcophagi, and monuments full of antiquarian interest: it is the church in which the German emperors were crowned kings of Italy. The Dominican Church of *Santa Maria delle Grazie* contains in its refectory the famous *Cenacolo*, or *Last Supper*, by Leonardo da Vinci. The Church of San Carlo Borromeo (1847) is notable; and the Church of St. Nazaro possesses several masterpieces of the best schools of Italian art. There is also the Church of St. Sebastiano, anciently a Roman temple.

Among secular buildings, the most noteworthy is the magnificent Brera Palace, formerly a Jesuit college, now used for public schools of the fine arts, with the official name Palace of Arts and Sciences. Within its vast precincts, this unique institution includes an acad. of art, a choice gallery of paintings of the Bolognese and Lombard schools, a fine collection of casts for modelling, a splendid public library of 140,000 vols., and a rare collection of manuscripts, medals, and antiquities: attached to it are an observatory and a botanical garden. Besides the Ambrosian (q.v.), there are several large private libraries. Among scientific and artistic institutions of M. are the museum of natural history, the schools of surgery and medicine, especially that of veterinary practice, the celebrated Conservatory, or school of music, and a military geographical institute, well known for the excellence of the maps that it has issued. The educational establishments include four gymnasia, besides normal schools, technical schools, conventual schools, and a seminary. The charitable institutions are numerous and splendidly endowed, having an aggregate property of

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more than \$35,000,000; the *Ospedale Maggiore*, or Great Hospital, founded by the ducal house of Sforza 1456, accommodates 2,000 patients, and annually admits more than 20,000. The Trivulzi Hospital, endowed by the Trivulzio family, maintains and clothes 600 aged pensioners. The Milanese places of amusement are on as grand a scale as the other public buildings of the city; the first in point of celebrity being the theatre *La Scala*, which can accommodate 3,600 spectators. The *Corso*, or chief street of M., is the universal fashionable promenade; and the famous arcade, or *Galleria di Cristoforis*, with its brilliant shops and cafés, is also a favorite place of evening resort, and on account of its gay appearance has been called 'Little Paris.' M. has immense inland trade in silk, grain, rice, and cheese; and has considerable manufactures of silk goods, ribbons, cutlery, and porcelain.

M. (Lat. *Mediolanum*) was originally a town or village of the Insubrian Gauls. It was conquered by the Romans B.C. 222, received the Latin franchise about B.C. 89, and the full Roman franchise B.C. 49. Under the Romans it became a conspicuous centre of wealth and civic influence; its citizens were noted for refined manners and literary tastes, and the public buildings for beauty and elegance. In the beginning of the 4th c., it was selected as the residence of the imperial court by Maximian. M. was sacked by the Huns (under Attila) 452, by the Goths (under the brother of Vitiges) 539, and passed to the Longobards and Franks previous to its subjection by the German empire. After 961, it was long governed by dukes in the name of the emperors. The feuds of the Guelphs and Ghibellines distracted M., like all the other Italian cities. Supreme power became eventually vested in the Ghibelline Visconti, by whom the ascendancy of M. was extended over the whole of Lombardy. 1535-1714 M. was a dependency of the Spanish crown; from the close of the war of the Spanish succession (1714) till the Napoleonic campaign of 1796, it was under Austria. Under Bonaparte, it was declared the cap. of the Cisalpine Republic, of the Italian Republic, and, finally, of the Kingdom of Italy. In 1815 M. was restored to Austria, and continued the cap. of the Austro-Italian kingdom until the Lombard campaign, with the battles of Solferino and Magenta, and the resulting annexation of Lombardy to Piedmont, 1859, by the peace of Villafranca, which made it a part of the kingdom of Italy: see ITALY.

In religion, the Milanese, by the force of circumstances, early developed a spirit of independence and a tendency to act and judge for themselves, which has led them at various periods to contest the extreme claims of the Roman see. The ritual of their bp. Ambrose is still in use; and it is reported that a strong party of the clergy in M. now incline to a reformed Catholicism, the use of the vernacular in the service, the marriage of priests, election of priests by the parishes, and similar reforms,

MILAN, *mē-lân'*, I., OBRENOVITCH, ex-King of Serbia: b. 1854, Aug. 10, at Jassy. He was adopted by his cousin, Prince Michael, and was educated at Paris. On the assassination of Michael (1868), he became prince, but the govt. was in the hands of a regency until 1872, when the prince attained his majority and assumed control of state affairs. He married (1875) the princess of Stourdza, from whom he has been divorced. He became involved (1876) in war with Turkey, and 1878 secured the recognition of Serbia as an independent state by the Treaty of Berlin. On the establishment of Serbia as a kingdom (1882), he took the title Milan I. An attempt to assassinate him in October of that year failed. Troubles with the queen led to his abdication in favor of his son Alexander, 1889, March 6. He died 1901, Feb. 11.

MILAZZO, *mē-lât'sō* (anc. *Mylæ*): fortified sea-port on the n. coast of the island of Sicily, 18 m. w. of Messina. Its situation is unhealthful. The chief exports are tunny, wine, silk, fruits, corn, oil, and liqueurs. The town is irregularly built, and is considered almost impregnable, owing to the great natural strength of its position and the extent of its military works and citadel. Garibaldi, with 2,500 men, defeated 7,000 Neapolitans here 1860, July 20, and compelled the garrison to evacuate the fortress.—Pop. about 8,000.

MILBURN, *mīl'bérn*, WILLIAM HENRY (widely known as 'the blind preacher'): b. Philadelphia, 1823, Sep. 26. He became nearly blind in early life, but obtained an education at Illinois College. He entered the Meth. ministry 1843 as an itinerant preacher, and while serving in this capacity travelled 200,000 m. He was also located for a while at Montgomery and Mobile, Ala., where he was a successful pastor. He became noted as an eloquent preacher and lecturer; was chaplain of the house of representatives at Washington 1856, and three years later made a successful lecturing tour in England. On his return to this country, he was ordained in the Prot. Episc. Church, but became again a Methodist 1872. He was chaplain of the house of representatives 1885-93, then of the Senate till his death. His published works include *Rifle, Axe, and Saddle-bags; Ten Years of Preacher Life; Pioneers, Preachers and People of the Mississippi Valley*. He died 1903, April 10.

MILCH, a. *mīlch* [Ger. *milch*, milk; *milken*, to milk; Icel. *milkr*, milk-giving; Gr. *amelgo*, I milk; Lith. *milzu*, to stroke, to milk a cow]: giving milk, as cows or goats; in OE., soft; merciful; sweet. *Note*.—In connection with OE. meaning, a suggested derivation is Gael. *milis*, sweet; *milsead*, sweetness, softness.

MILD, a. *mīld* [Ger. *mild*, soft; Icel. *mildr*, lenient; *mīlda*, to soothe; AS. *mild*, merciful]: soft, smooth, or gentle; affecting the senses gently and agreeably; acting or operating gently; not stern, rough, or angry; not acrid; sweet and mellow; not sharp. **MILD'LY**, ad. *lī*, in a mild manner; tenderly; not severely. **MILD'**

MILDEW.

NESS, n. -*nēs*, quality of being mild; softness; tenderness; gentleness of operation; pleasant condition.—**SYN.** of 'mild': meek; bland; good; tame; tranquil; calm; merciful; kind; placid; compassionate; clement; indulgent; tender; soothing; demulcent; softening; lenitive; mollifying; assuasive; moderate.

MILDEW, n. *mīl'dū* [Ger. *mehlthau*, meal-dew; OHG. *militou*, rust on corn: comp. Gael. *mill-cheo*, mildew—from *mīl*, to injure; *ceo*, a mist]: a disease which attacks plants; rust; blight; moldiness; spots of mold caused by moisture, on linen, paper, etc. **M.** is a term vaguely applied to certain diseased states of plants caused or characterized by the growth of small parasitical fungi; also to spots on cloth, paper, etc., and even on the surface of glass and other inorganic substances, produced by growth of minute fungi. The **M.** fungi are numerous, and the name **M.** is often given to many that are known also by other names, as **BLIGHT: BRAND: BUNT: RUST: ETC.** (see these titles; also **BOTRYTIS: OIDIUM**). Different species or families of plants have their own peculiar parasites; several kinds of parasitic fungus, however, are often known to infest one plant. Probably the name **M.** belonged originally to those molds which form white mealy patches on leaves. Some of these are of the genus *Erysiphe*, which exhibits fleshy, somewhat gelatinous masses, becoming globose *sporangia*, filled with spore-containing *asci*, and surrounded by a flocky *mycelium*, often spreading widely over the leaves and other parts of plants. Maples are sometimes covered with a **M.** of this kind, so as to be quite hoary. Similar mildews are often seen on pease and other leguminous plants; also on umbelliferous plants. Sulphur has been found a cure in some of these cases.—Many of the most destructive mildews are of red or brown color, as the **M.** of the pear, *Aecidium cancellatum*, that of the barberry, *Aecidium Berberidis*, etc.; while some are almost black, as the corn **M.**, *Puccinia graminis*, by which the crops in some years are greatly injured. Whether **M.** is the consequence of unfavorable weather and of fungi attacking an already weakened plant, or is the consequence of infection by spores of fungi brought through the air or soil to a plant previously healthy, is not ascertained; probably sometimes the one may be the case, sometimes the other. There is no doubt that many kinds of **M.** appear chiefly toward the close of summer on leaves in which vegetable life has already mostly lost its power. **MILDEW**, v. to taint with mildew. **MIL'DEWING**, imp. **MILDEWED**, pp. *mīl'dūd*: **ADJ.** affected with mildew. *Note.*—From the facts that *mildew* is generally found in the form of a dark or black smut, and that all kinds of it are produced by parasitic fungi, a connection is indicated with the Gael. *mīal-dhu*, black aphides, or lice, upon plants—from *mīal*, a tick or aphis, and *dhu*, black. Doubtless the similarity of the first syllable suggested a connection with *L. mel*, honey, and the transference to some kinds of *mildew* of a whitish appearance, of the popular term *honey-dew*.

MILE—MILES.

MILE, n. *mīl* [F. *mille*, a mile—from L. *milliā*, a thousand: L. *mille passūm*, a thousand paces, a mile]: largest terrestrial measure of length in common use among the British and most of the European nations, and in the United States: in Britain and the United States it is 1,760 yards of 3 ft. each, = 5,280 ft. The term is derived from the Roman *milliare*, which contained 1,000 paces of 5 Roman ft. each, the pace being the average length of the step made by the human foot. The Roman foot being accounted as between 11·65 and 11·62 English inches, the Roman M. was thus less than the present English M. by from 142 to 144 yards; thus the Roman M. measured from 4,848–4,854 ft. English.—The length of the modern M. in different countries shows unaccountable diversity. Before the time of Elizabeth, scientific writers made use of a M. of 5,000 English ft., from the notion that this was the Roman M., forgetting the difference in value between the English and Roman foot. The present English M. is known as the ‘English statute M.,’ because it was incidentally defined by an act passed in the 35th year of the reign of Elizabeth to be ‘8 furlongs of 40 perches of 16½ ft. each’—i.e., 1,760 yards of 3 ft. each; and it has since retained this value. The *geographical* or *nautical mile* is the 60th part of a degree of the equator (it is stated approximately at $69\frac{1}{10}$ English statute miles; but see DEGREE OF LATITUDE), and is employed by the mariners of all nations; but in Germany the geographical M. denotes $\frac{1}{15}$ part of a degree of the equator, or 4 nautical miles. The following table gives the length, in English statute miles, of the various miles that have been or are commonly used:

	Eng. Miles.
English geographical mile,	= 1·153
German geographical mile,	= 4·611
Tuscan mile,	= 1·027
Ancient Scotch mile,	= 1·127
“ Irish mile,	= 1·273
German short mile,	= 3·897
Prussian mile,	= 4·680
Danish mile,	= 4·684
Hungarian mile,	= 5·178
Swiss mile,	= 5·201
German long mile,	= 5·753
Hanoverian mile,	= 6·568
Swedish mile,	= 6·648
The French kilomètre,	= 0·621
and 29 kil. = 18 English statute miles nearly.	

MILEAGE, n. *mīl'āj*: fares paid for travelling by the mile in a conveyance. **MILEPOST**, or **MILESTONE**, post, stone, or other mark placed on a roadside to indicate the distance in miles of a traveller from a town or central place.

MILES, *mīlz*, NELSON APPLETON: b. 1839, Aug. 8, Wachusettville, Mass. He studied at an acad. and afterward obtained a position as salesman in a Boston store. He entered the army 1861, Sep. 9, as lieut. 22d Mass. vols., and was wounded in the battles of Fair Oaks, Mal-

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vern Hill, and Chancellorsville. In 1862 he became col. of the 61st N. Y. vols., and 1864, May 12, he was appointed brig.gen. vols., being with one exception the youngest man who had attained this rank in the army. He was prominent in the Richmond campaign 1864, and was brevetted maj.gen. In 1866 he was col. of the 40th U. S. infantry, but was transferred to the 5th infantry 1869. In 1867 he was brevetted brig.gen. and maj.gen. vols., and commissioned brig.gen. in the regular army 1880, Dec. 15. For brilliant services in subduing hostile Indians on the frontier, he has received the thanks of several state and territorial legislatures, honorable mention in a message to congress by Pres. Cleveland, and an elegant sword presented by the people of Arizona, 1887; promoted maj.gen. 1890; led the American expedition for the conquest of Porto Rico 1898; promoted lieut.-gen. 1900 and 1901; retired 1903, Aug. 8.

MILESIAN, n. *mĭ-lĕ'zhĭ-ăn*: a native or inhabitant of *Milētus*, an anc. city of Asia Minor. The term is applied also to natives of Ireland, descended, according to the legend, from *Milesiūs of Spain* (see FIRBOLGS).

MILETUS, *mĭ-lĕ'tŭs*: anciently, greatest and most flourishing city of Ionia, in Asia Minor. It was at the mouth of the Mæander, and was famous for woollen manufactures and extensive trade with the north. Before being forcibly colonized by the Ionians, it appears to have been inhabited by Carians. M. early founded a number of colonies on the Black Sea and in the Crimea, possessed a fleet, which sailed to every part of the Mediterranean, and even ventured into the Atlantic, and maintained long and expensive wars with the Lydian kings. Before the middle of B.C. 7th c., M. had founded more than 60 cities along the Hellespont, the Propontis, and Black Sea coast. The 'Milesians' were believed to be the purest representatives of the Ionians in Asia. After the conquest of Lydia by the elder Cyrus, it was subdued, with the whole of Ionia. It continued, however, to flourish till it was excited to rebellion against the Persians in the Ionian war, and was destroyed B.C. 494. It was rebuilt, but never regained its former importance. Its harbor gradually silted up, and the site of M. is now a marsh. M. has an honorable place in the history of Greek literature, being the birthplace of the philosophers Thales, Anaximander, and Anaximenes, and of the historians Cadmus and Hecataeus.

MILFOIL, n. *mĭl'foyl* [F. *mille*, a thousand: OF. *fuil* or *foil*, a leaf—from L. *millĕ*, a thousand; *folĭŭm*, a leaf]: the herb yarrow, found growing on roadsides, having small white flowers and numerous narrow pointed leaves; *Achillĕa millĕfolĭŭm*, ord. *Compositæ*.

MILFORD, *mĭl'ford*: town in New Haven co., Conn.; on Long Island sound; about 11 m. s.w. of New Haven; on the New York New Haven and Hartford r.r., with a station at the junction of this r.r. with Naugatuck r.r. It was settled 1639, Nov., and originally organized as a

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kind of free ecclesiastical republic, the site having been purchased from the Indians. M. has good public schools, a newspaper, bank, several hotels, and not less than 5 churches. Its chief manufactories are the automatic book-sewing machine company, straw goods, boots and shoes, and carriages. Pop (1890) 3,811; (1900) 3,783.

MILFORD: town in Worcester co., Mass.; about 30 m. s.w. of Boston; 18 m. s.e. of Worcester; 14 m. from South Framingham; at the junction of the Milford branch of the Boston and Albany r.r. with the Milford and Woonsocket and the Hopkinton r.rs. It has a town-house and public library (1902, Sept.) 2 national banks (cap. \$380,000), and 1 savings bank, publishes a weekly newspaper, has 6 churches, and was formerly one of the largest boot and shoe manufacturing towns in New England. It still has large boot and shoe factories, machine-shops, tanneries, and manufactories of straw goods. In its vicinity are the thriving villages of Milford Centre, North, East, and South Milford, and Hopedale. Pop. (1890) 8,780; (1900) 11,376.

MILFORD: town in Pike co., Penn.; on the Delaware river, and the New York Lake Erie and Western and the Port Jervis and Monticello railroads; 8 m. s.w. of Port Jervis, 97 m. n.w. of New York. It is in the most picturesque part of the Delaware valley, on a broad plateau 400 ft. above tide-water terminating in an abrupt bluff, with a semicircular range of mountains rising above the town on the n.w. and s. About 1 m. from M. are the Sawkill Falls and the Cliffs (1,000 ft. above the wagon road); 3 m. below are the Falls of the Raymondskill; 8 m. below is the popular summer resort, Dingman's; and 13 m. below are the cataracts on the Big and Little Bushkill creeks. M. was laid out 1800; has been a popular place for summer rest and the starting point for bear-hunting parties for many years; contains several ante-revolutionary buildings; and has 12 hotels, numerous private boarding-houses, 4 churches, graded school, acad., and 2 summer newspapers. Pop. (1900) 172. Summer pop. about 7,500.

MILFORD, *mīlford*: parliamentary borough (contributory to Pembroke) and sea-port of S. Wales, county of Pembroke, on the n. shore of Milford Haven, 7 m. e.n.e. of St. Ann's Head. The haven is said to be unequalled as a harbor by any other in the world. It is a land-locked estuary running inland 17 m. to Langwin (which is easily reached by vessels of 2,000 tons), and 1 to 2 m. in breadth. It is protected from winds by a girdle of undulating hills, is deep (15 to 19 fathoms in most parts, with spring-tides rising 25 ft.), easy of access, and capable of anchoring the whole fleet of England in safety. The excellence of the haven has been recognized from the earliest times; but the rise of the town of M. may be said to have begun with the 19th c., when docks and quays, with a mail packet-station for Ireland, a dock-yard, ship-building slips, and an arsenal

were established here, only, however, to be removed in 1814. Since that time, with only occasional gleams of prosperity, M. has been in a declining condition; but the opening of the M. railway, and the construction of docks and wharves, have given a new impetus. New docks, capable of accommodating vessels of the largest tonnage, were completed 1882. The new available dock area is 60 acres, and commercial prosperity is now looked for. In 1880 there entered the port 1,624 vessels, of a burden of 407,475 tons; and 1,625, of 377,335 tons, cleared. Pop. (1881) 3,813.

MILHAU, or MILLAU, *mē-yō'*: town of France, dept. of Aveyron, in a rich and fertile dale on the right bank of the Tarn, 55 m. n.w. of Montpellier. During the 16th and 17th c., it was one of the strongholds of the Calvinists. Leather and gloves are manufactured, and there is a good trade in wool, timber, hides, cheese, and wine. Pop. (1881) 15,363.

MILIARY, a. *mīl'ī-ā-rī* [F. *miliaire*, miliary—from L. *miliārīa*, a weed destructive to millet—from *miliūm*, a kind of small grain called millet]: in *med.*, M. fever is an eruptive fever accompanied with innumerable white pimples resembling millet-seeds. MILIARY GLANDS, the sebaceous glands of the skin.

MILICZ, *mē'lich* (or MILITSCH) OF KREMSIER: religious reformer: abt. 1325–1374, June 29; b. near Olmütz, Moravia. He was in official service of the church 1350, and 1360 was canon of the cathedral at Prague, archdeacon, and connected with the court of the emperor. In 1363 he surrendered his offices, but continued preaching to the students in Latin and to the poor in their native tongue. His street preaching was wonderfully successful. In 1367 he made a fruitless visit to Rome to present to Urban V. his views concerning evils and abuses within the church. He returned to Prague, where he preached until he was summoned, to answer charges, to the papal court at Avignon, where he died before his case came to trial.

MILIOLA, n. *mīl'ī-ō'lā* [L. *miliūm*, millet]: in *geol.*, a genus of minute foraminiferous shells—so called from their resemblance to millet-seed—occurring in myriads in certain strata. MILIOLITE, n. *mīl'ī-ō-līt* [Gr. *lithos*, a stone]: a fossil shell of the genus *miliola*. MIL'IOLIT'IC, a. *-līt'ik*, or MIL'IOLITE, a. *-līt*, of or pertaining to or containing miliolites. MILIOLITE LIMESTONE, a building-stone, one of the group of the Paris basin, almost entirely made up of these microscopic shells.

MILITANCY, n. *mīl'ī-tān-sī* [see MILITANT]: in *sociology*, social condition of a nation or tribe ideally organized for war. In such a state of society the tendency is for the body of warriors to bear the largest practicable ratio to the body of workers; individuality becomes merged in the community; despotism and centralization ensue, and a process of regimentation goes on even in civil life; freedom of movement from place to place is

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restricted; state organizations take the place of private combinations; and such a society usually evolves, or endeavors to evolve, a self-sufficient sustaining organization, drawing, as much as possible, all supplies from its own resources.

MILITANT, a. *mīl'ī-tānt* [L. *milītans* or *milītan'tem*, serving as a soldier; *milītātus*, served as a soldier—from L. *mīlēs*; It. *milite*, a soldier]: serving as a soldier; fighting; engaged in warfare. **THE CHURCH MILITANT**, the Christian Church on earth, as engaged in constant warfare against her enemies—*church triumphant*, the Christian Church in heaven. **MILITARY**, a. *mīl'ī-tēr-ī* [F. *militaire*—from L. *milītāris*, of or belonging to a soldier]: pertaining to soldiery or to arms; engaged as a soldier; derived from services or exploits of a soldier; warlike; martial: N. the soldiery; the army. **MILITARISM**, n. *mīl'ī-tēr-īzm*, that state or condition of a country in which government by force or the sword is predominant, in contradistinction to a popular and constitutional government. **MILITATE**, v. *mīl'ī-tāt*, to operate unfavorably; to act in opposition, followed by *against*. **MILITATING**, imp. **MILITATED**, pp. **MILITIA**, n. *mī-līsh'ā* [L. *militiā*, warfare]: citizens embodied and trained as soldiers, liable to serve for the internal defense of a country; a body of men trained and disciplined in military tactics, but not regular soldiers (see **MILITIA**, below). **MILITIAMAN**, n. *-ā-mān*, one who serves in the militia; one not a regular soldier.

MILITARY ACADEMY, **ROYAL**: establishment at Woolwich, England, through which must pass all candidates for the Royal Artillery and Royal Engineers. The age for entrance is 17 years, and the vacancies are open to public competition. The pupils are denominated military cadets, and the parents or guardians have to make a considerable payment in regard to each, so long as they remain at the acad.; the annual charge for the son of a civilian being £120, that for the son of a naval or military officer less, according to rank of the father. When the term of instruction—which comprises a thorough general education, with the higher mathematics, fortification, gunnery, and military duty—is completed, the cadets compete for the vacancies in the engineers and artillery, those who pass the best examination being allowed to select the former corps. Those who obtain commissions in the engineers proceed to Chatham for further instruction (with military pay, however) in their professional functions. The artillery cadets at once join the Royal Artillery as lieutenants.

MILITARY ACADEMY—MILITARY.

MILITARY ACADEMY, UNITED STATES: see UNITED STATES MILITARY ACADEMY.

MILITARY ASYLUM, ROYAL: educational government institution at Chelsea, England; near, but wholly distinct from, the Royal Hospital for Pensioned Soldiers. Its object is the suitable education for trade, etc., of 500 male children—generally orphans—of British soldiers. For these, there are a model school and an infant school, and the boys have a completely military organization, with scarlet uniform, band, etc. As a result of their training, a large proportion of the pupils ultimately volunteer into the army. The school was established 1803 by the Duke of York, whence it is still commonly known as the 'Duke of York's School.' Originally a similar school for soldiers' daughters was included, but was not found desirable, and has been discontinued. Attached to the school is a training establishment for military schoolmasters, known as the Normal School.—There is a similar institution, the Royal Hibernian Military School, at the Phoenix Park, Dublin.

MILITARY FRONTIER (Ger. *Militärgrenze*): former name of a narrow strip of land of the Austro-Hungarian empire, along the Turkish frontier. It had a special military constitution, and formed a separate 'crown-land'; about 7,500 sq. m.; pop. (1869) 699,300. The peculiar institutions of the M. F. have been abolished; portions of the territory have been incorporated with adjoining provinces; and since 1873 the remainder of the M. F., now officially termed the Croato-Slavonic Border-land, forms, with Slavonia and Croatia, a dependence of the Hungarian Crown. This change was completed 1881; and the constitution, civil and military, is now similar to that of the other provinces of the Hungarian part of the empire.

The M. F. owes its origin as a crown-land to the necessity of having a permanent body of defenders on the borders during former wars, especially wars with the Turks. In the 15th c., the Austrians had gained from the Turks certain tracts of territory on the banks of the Save and Danube. These tracts they colonized, giving the inhabitants peculiar privileges, but with the condition that the colonists must render military service against the Turks. Thus originated the Capitanate of Zengg, during the reign of Matthias Corvinus. The Warasdin Frontier originated in the same manner in the 16th, and the Banat Frontier in the 17th, c. The M. F. had, along the whole boundary, a series of guard-houses accommodating 4 to 13 men each.

MILITARY LAW: body of statutes, rules of procedure, regulations, and orders, for the government of the military forces of a country, including maintenance of discipline and all details of administration. The term is sometimes improperly applied to Martial Law (q.v.): see also COURT-MARTIAL.

MILITARY, MILITIA: see under MILITANT.

MILITARY OPERATIONS—MILITARY SCHOOLS.

MILITARY OPERATIONS: see STRATEGY: TACTICS, MILITARY.

MILITARY ORDERS: religious associations which arose from a mixture of the religious enthusiasm and the chivalrous love of arms which almost equally characterized mediæval society. The origin of such associations may be traced to the necessities of the Christian residents of the Holy Land, in which the monks, whose first duty had been to serve the pilgrims in the hospital at Jerusalem, were compelled, for self-defense, to assume the character of soldiers as well as of monks. See ST. JOHN, KNIGHTS OF. The order of the Templars (q.v.) was of similar origin. Those of Alcantara and Calatrava in Spain had for immediate object the defense of their country against the Moors. These orders, as well as that of Avis in Portugal, instituted with a similar view, followed the Cistercian rule, and all three differed from the Témplars and the Knights of St. John in being permitted by their institute to marry once. The same privilege was enjoyed in the Savoyard order of Knights of St. Maurice and the Flemish order of St. Hubert. On the contrary, the Teutonic Knights, who had their origin in the Crusades (see GRAND MASTER), were bound by an absolute vow of chastity. With the varying conditions of society, these religious associations have at various times been abolished or fallen into disuse; but most of them still subsist in the form of orders of knighthood; and in some of them, attempts have recently been made to revive, with certain modifications, their original monastic character.

MILITARY SCHOOLS: institutions of instruction of various kinds, for persons connected with the army.—In the *British* army, they are divisible into several classes: 1. Those for the education of officers already in the service; of these, are the Staff College (q.v.), the School of Military Engineering, and Garrison Schools of Instruction. 2. Professional schools common to officers and men; for these, see ARTILLERY—*Schools*: MUSKETRY, SCHOOLS OF. 3. Schools for professional education of candidates for commissions; for these, see MILITARY ACADEMY, ROYAL: SANDHURST MILITARY COLLEGE. 4. Schools for men in the ranks and for their children; for these, see SCHOOLS, REGIMENTAL: for the instruction provided for their sons or orphans, see MILITARY ASYLUM, ROYAL.

In *France*, where a military commission is one of the best scholastic prizes looked forward to, no attempt is made to impart general education at the military seminaries; a boy is required to have a thorough general knowledge before he can be admitted to these institutions. Open to universal competition, and being the only channel—or nearly so—to the best employment under the state, the great M. S., by the high standard required for them, give great impetus to general education; and the Lycées, or public schools, adapt their

course of instruction to the anticipated competition. In the army, two-thirds of the line commissions (after a service of two years in the ranks, or after one year's service, and passing the final examination at the Infantry School at St. Maixent), and one-third of those for the scientific corps, are given to non-commissioned officers, but few of these rise beyond the rank of captain; the remaining commissions in the line and scientific corps, and all appointments to the staff, are given by competition, after a careful course of professional education. The candidates in open competition (in civil subjects only) are placed according to merit either in the Infantry School of St. Cyr, or the celebrated Polytechnique; at both colleges, they have the right, if they need it, to partial or entire state support. From the School of St. Cyr, the more promising pupils pass to the Staff School, and thence, after a thorough course, to the *État Majeur* of the army; the remaining students pass as subalterns into the line. The pupils of the Polytechnique, which is entered after the age of 17 years, have annually about 160 valuable prizes open to them. The first 30 to 40 candidates usually select civil employment under the state, such as the '*Ponts et Chaussées*;' those next in merit choose the artillery and engineers, and pass through a technical course at the School of Application. The remaining students either fail to qualify, and leave the school, or have to content themselves with commissions in the line, subordinate situations in the government, civil or colonial service, or they retire into civil life altogether. In actual service, there are schools for the men, who are taught also trades and singing. The standard of education among French is far higher than among English soldiers, as the conscription draws the men from all classes of society.

In *Germany*, the system of military education differs from that of France in that competition is sparingly resorted to; and the object is to give a good general and professional education to all the officers, rather than a specially excellent training to a selected few. Aspirants for commissions must enter in the ranks as gentleman-volunteers (*avantageurs*), and within six months pass a good examination in general and liberal knowledge (about equivalent to that passed in England for entrance into Sandhurst); if, however, the candidate has been educated in a cadet-house—semi-military schools for youths—and has passed properly out of it, he joins the army in a rank equivalent to midshipman in the navy (*porte-épée fähnrich*). After some further service, the aspirant goes for nine months to one of three '*Division Schools*,' where he completes his professional education. If he pass the standard here required, he is eligible for the next vacancy, but cannot be commissioned, unless the officers of the corps are willing to accept him as a comrade. The Artillery and Engineer schools do for those services what the Division Schools do for the line. The culmination of German military education is the Staff school, open

MILITARY SECRETARY—MILITELLO.

to competition for all the officers of the army, and presenting the highest prizes in the profession. In all the schools, the candidates study at the expense of the state, or receive great auxiliary grants.

In *Austria*, the preliminary step to a commission is obtaining the rank of a cadet, either from a Cadet School (which boys have to enter at an early age), or by passing the same examination as cadets from these schools have to pass. If recommended, they become officers after a year's service and showing a proper knowledge of their work. Cadets from the schools have the advantage of being commissioned at once if qualified. The young officer's chance of entering the Staff School—and therefore the staff—depends on his place at the final examination at a line or scientific corps academy. There are schools for training for non-commissioned officers and for officers; and senior departments for imparting more extended instruction to both classes. Candidates for appointment as non-commissioned officers pass by competition through the lower houses, where they remain till 11 years old; the upper houses, which detain them till 15; and the school companies, whence, after actual apprenticeship to service, a few pupils pass to the academies for aspirants for commissions, and the others are drafted into the service as non-commissioned officers.

In *Italy*, the system nearly approaches that of France. The educational status of the Italian officers is considered high.

For governmental military education in the United States, see UNITED STATES MILITARY ACADEMY.

MILITARY SECRETARY: officer on the personal staff of generals in high command. His duties are to conduct the correspondence of his chief, and to transact a great amount of confidential business, which would quite unduly occupy the time of the general himself.

MILITARY TRAIN: formerly a highly important corps of the British army, having the function of transporting the provisions, ammunition, and all other matériel, together with the wounded in time of battle. It was formed after the Crimean war, on the dissolution of the Land-Transport Corps, and comprised six battalions, in all 1,840 officers and men, and 996 horses, with proportionate wagons and ambulances. It constituted only the nucleus of a transport service for a large army. It was disbanded 1870, as being too military in its formation; and its functions are now performed by the transport staff of the commissariat department, assisted in time of war by a regimental transport train.

MILITELLO, *mē-lē-tēl'lo*: city of Sicily, province of Catania, 21 m. s.w. of the town of Catania; on a mountain, in a somewhat unhealthful situation. In its vicinity are important salt lagoons.—Pop. 10,000.

MILITIA.

MILITIA: term which has now acquired the meaning of the domestic force for the defense of a nation, as distinguished from the regular army, which can be employed at home or abroad in either aggressive or defensive operations. Every nation has a reserve, under its law military, upon which its defense would fall, on the serious discomfiture of the regular army, or of a portion of it; but the system differs in each country.

In Great Britain, the M. is a constitutional force raised under sanction of parliament, in which the people—in theory, at least—wage their own bodies for the defense of their own soil, and in which they depute the sole leadership and command to the sovereign and the crown nominees. Organized by counties and cities, it is essentially a local force; but the right of granting commissions, formerly held by the lords-lieutenants, was transferred to the crown by the act of 1871. Under the Anglo-Saxons, all men were required to bear arms, as a sort of body-rent for the land that they held; but no special organization being adopted, efficiency was rarely attained in the use of arms. This the nation found, to its cost, when the Danes overran it during Alfred's reign. That great king, to prevent a similar occurrence, established the M. or *fyrð*, making land the basis of numbers, but the family system the basis of discipline: so many families were a tithing, ten tithings a hundred, and hundreds were united into county powers, each under its *heretoch*, dux, or duke. Each section of the community had not only to furnish its quota in time of war, but also to provide arms, keep them in repair, and undergo so many days' training every year. This arrangement subsisted in more or less vigor until the Conquest; then the feudal troops at first rendered the M. unnecessary; but it never wholly ceased to exist. When the crown began to contend with the Norman barons, it naturally found its most powerful instrument in reviving the Saxon M.; and the English yeomanry became thenceforth the fear of England's enemies, and a guarantee for the gradual enfranchisement of the people. Henry II. established 'an assize of arms,' at which every holder of land was bound to produce one or more men fully equipped, and capable of fighting in the national defense. This annual assembly of the *fyrð* or M. is recorded after the Conquest first in 1181. Further alterations to suit advances in the art of war took place 1558. In 1604 James I. abolished the *fyrð*, and substituted 'Trained (commonly called Train) Bands,' to the number of 160,000 men—a force partaking of the nature of M. and volunteers, but deficient in discipline and drill. During the civil war of Charles I., the train bands or M. mostly sided readily with the parliament. Up to this time, the command had never by any law been definitely assigned to the crown or to any other authority. After the Restoration, the loyal parliament of Charles II. immediately reorganized the M.—essentially on its present footing—and declared as law that 'the sole supreme

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government, command, and disposition of the M. is, and by the laws of England ever was, the undoubted right of his majesty and his royal predecessors.' As, however, the crown from this time began to depend for its support upon a mercenary army, the M. was neglected until 1757, when a large portion of the regular army being absent in the Seven Years' War, it was carefully organized for defense of the kingdom. Several militia acts have been subsequently passed. In 1871 the control of the M. was transferred from the lords-lieutenants to the war office. Various laws on army organization, completed 1876, had for a prominent aim the consolidation of the national defenses by bringing the army, militia, and other military forces into closer connection. The United Kingdom is now divided into 15 military districts, with 69 infantry regimental districts (besides cavalry and 11 artillery territorial divisions). To each belongs a territorial brigade, consisting of two line battalions, from two to nine militia battalions, the regimental depot, volunteer battalions, and the men in the Army and Militia Reserve. The members of the M. volunteer into the reserve, and may thence, in time of emergency, be directly drafted into the regular army. The M. Reserve (1884) numbered about 30,000.

In practice, the quota of men for each district are raised by voluntary recruitment; but should volunteering fail, a levy by ballot, for which the legal power always exists, would be made on all the inhabitants of the locality between the ages of 18 and 35. Many classes are exempt from the ballot—e.g., peers, soldiers, volunteers, yeomanry, resident members of universities, clergymen, parish schoolmasters, articled clerks, apprentices, seafaring men, crown employes, free watermen of the Thames; in England, any poor man with more than one child born in wedlock; in Scotland, any man with more than two lawful children, and not possessed of property to the value of £50; in Ireland, any poor man not worth £10, or who does not pay £5 per annum for rent, and has more than three lawful children under the age of 14. The M. battalions are bound, when called by the crown, to assemble annually for any period not exceeding 56 days, for training purposes; and the govt. can embody the whole, or part of the force, at any national crisis. In 1815 the M. had been embodied for nearly 20 years, and the regiments were again embodied almost without exception during the Russian war of 1854–56, and to a considerable extent at the time of the Indian mutiny, 1857–59. The quota of the United Kingdom (including the Channel Islands M.) is 143,459 men, of which number 121,000 may be considered effective. They may not be sent out of the kingdom, except they volunteer, and then only by special permission of parliament. As a defensive or garrison force, setting free the regular army for aggressive operations, the M. is a most valuable institution; and in times of war it has ever been found an admirable training-school whence soldiers vol-

unteer into the permanent forces. Its efficiency has been vastly increased during the last 25 years. When out for training, or embodied for permanent duty, the M. officers and men receive the same pay as regular troops of corresponding arms of the service, and are under the Army Discipline Act, except that no punishment can extend to life or limb. The officers rank with, but junior to, their brethren of the regular army, and are always subject to military law. There is no distinction in uniform between regular and M. troops, except that in the latter the letter M is borne on the shoulder-strap.

The Channel Islands M., consisting of 4 corps of garrison artillery and six regiments of infantry (in all about 4,000 men), is on a totally different footing from that of the M. in other parts of the United Kingdom. The origin of the force dates from 1201. The basis of service is a modified conscription.

The celebrated Local M. was instituted in England and Scotland 1808, and suspended 1816. It consisted of a force for each county six times as numerous as the proper M. quota, comprising, of course, many classes which, from age or other circumstances, were unsuitable. These troops could not be marched beyond their respective counties except to meet actual invasion.

The M. of the United States is held as a reserve force always available for an emergency, but not kept constantly under arms. Under the constitution, congress has power to provide for the calling out of the M. when needed to enforce the laws in any portion of the Union which may be in insurrection or rebellion, or to meet an actual or threatened invasion. The organization, equipment, and method of training of the M., and the government of the force while in the actual service of the United States, also are under the control of congress, but the appointment of officers and the practical disciplining of the troops is delegated to the several states by which the men are supplied. When the M. is in the service of the govt., the pres. is commander-in-chief and can issue his orders to any officer or officers that he may choose. By act of congress, 1792, all able-bodied white male citizens not less than 18 and under 45 years of age, with the exception of certain govt. officers and persons who under the state laws might claim exemption from service in the field, were to be enrolled in the M. and properly armed and equipped. The act also provided that the force should be divided into infantry, cavalry, and artillery; and designated the rank and title of the various officers which were to be appointed by the states. A later act, 1795, conferred upon the pres. power to call upon the M. of any state or states in case of threatened invasion, insurrection against the state govt., interference with judicial processes, etc.; and the M. thus called upon for service were to be subject to the same rules and receive the same pay as soldiers in the regular army. With the exception of the removal, 1867, of the word

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'white' from the specifications regarding enrolment and a change in length of the term of service, these acts remain in force. The extreme period of service, fixed at three months by the act of 1795, was changed 1861 to 60 days after the opening of the next regular session of congress, unless otherwise specified by law. In 1862 the pres. was given power to specify the period of service when calling out the M., provided it should not exceed nine months. Each state has its laws regulating the M. The persons exempt from service are mainly officers of the govt. or of courts, clergymen, teachers, physicians and surgeons, firemen, etc. By virtue of his office, the gov. of a state is commander-in-chief of its M., but the method of appointment or election of the subordinate officers varies in different states. For a long period each state had its annual muster, which every member of the M. was required to attend, but in many of the states this system has not of late been maintained. In not a few states, volunteer companies have practically superseded the M. organizations. The total enlisted M. 1903 reported to the adj.-gen.'s office was 183,596; men available but unorganized, 8,727,500.

MILK, *n. mĭlk* [see MILCH]: white fluid drawn from the breast of mammiferous females for the nourishment of their young; white fluid yielded by the cow: the white juice of plants: V. to draw or press out the milk of; to draw from the udder of a cow; to add milk to. MILK'-ING, *imp.* MILKED, *pp. mĭlkt.* MILK'ER, *n. -ér*, one who milks. MILKY, *a. mĭlk'ĭ*, yielding milk; full of milk; juicy; whitish, as milky fluid; gentle. MILKILY, *ad. mĭlk'ĭ-lĭ*. MILK'INESS, *n. -nĕs*, qualities like those of milk. MILK'MAID, a woman that milks cows, or is employed in the dairy. MILK-QUARTZ, a compact vitreous variety of quartz, occurring in veins of the older rocks, of a milk-white color and somewhat greasy lustre. MILK-SNAKE, or CHICKEN-SNAKE (*Ophibolus eximius*), harmless snake, usually small, though sometimes 5 ft. in length; occasionally found in stables, dairies, and houses. It feeds on mice, toads, insects, and little birds. It is of milk-white color above, sometimes tinged with red and with dusky spots, and of silvery or yellowish white below. MILK'-SOP, a piece of bread dipped in milk; a soft, effeminate man. MILK'-TEETH, the first or deciduous teeth. MILK'-TREE, a tree yielding a milky juice fit for food; the Cow Tree (*q.v.*): the juice of the *Tab'ernæmon'tānă utilĭs*, *ord. Apocynăcĕæ*. MILK-VETCH (see ASTRAGALUS). MILK-WEED (see ASCLEPIADACEÆ: ASCLEPIAS). MILK'-WHITE, white as milk. MILK-WORT, small wild plant with blue, pink, or white flowers; the *Polyg'ăla vulgăris*. *ord. Polygalăcĕæ* (see POLYGALA). MILKY WAY, the broad white zone or belt seen in the heavens, slightly luminous, ascertained to be formed of innumerable stars; the galaxy (see GALAXY). SUGAR OF MILK: see SUGAR (*Milk Sugar*). MILK OF LIME, slaked lime in water—having a milky appearance.

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MILK: opaque white fluid secreted by the mammary glands of females of the class *Mammalia*, after they have brought forth their young, and during the period in which their offspring are too immature to subsist on solid food. It is devoid of odor, except for a short time after its extraction; is of slightly sweet taste, usually of a slightly alkaline reaction (except in the *Carnivora*, in which it is acid); and its average specific gravity (in the case of human milk) is 1032.

When M. has been allowed to stand for some time, a thick, fatty, yellowish-white stratum (the cream) forms upon its surface. When this is removed, the fluid below (popularly known as 'skim-milk') is found to be of greater specific gravity, and of a more bluish-white tint. M. does not coagulate on boiling, but a membrane or film of coagulated caseine, containing fat corpuscles, forms upon its surface. If M. be allowed to stand for some days exposed to air at the ordinary temperature, it gradually exhibits an increasing acid reaction, from the formation of lactic acid from the milk-sugar; while the caseine, becoming coagulated by the action of the lactic acid, is separated in the form of 'curds,' and the fluid gradually assumes the form of a thickish pulp. The ordinary means of obtaining the caseine (which exists in solution in the M.) in the form of curds is by the addition of a piece of rennet (the dried stomach of the calf), which acts as powerfully as any acid. The curds thus separated form the basis of cheese, while the fluid portion left after their removal is known as the 'whey.'

The following table, based on the researches of Ver-
nois and Becquerel, represents the density and composi-
tion of 1,000 parts of M. in various animals:

	Density.	Water.	Solid Constituents.	Caseine and Extractive Matters.	Sugar.	Fat (Butter).	Salts.
Woman, . . .	1032·67	889·08	110·92	39·24	43·64	26·66	1·38
Cow,	1033·38	864·06	135·94	55·19	38·03	36·12	6·64
Mare,	1033·74	904·30	95·70	33·35	32·76	24·36	5·23
Ass,	1034·57	890·12	109·88	35·65	50·46	18·53	5·24
Goat,	1033·53	844·90	155·10	35·14	36·91	56·87	6·18
Ewe,	1040·98	832·32	167·68	6·78	39·43	51·31	7·16
Bitch,	1041·62	772·08	227·92	116·88	15·29	87·95	7·80

The actual caseine, which in the preceding analyses is associated with the undefined group of substances termed *extractive matters*, ranges from 27 to 35 in 1,000 parts of healthy human M., while in the colostrum it amounts to 40; in the milk of the cow it is somewhat higher; while in that of the bitch, and probably of all carnivorous animals, it is more than trebled. It is found in the case of women that the quantity of the caseine increases with

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the free use of animal food, and diminishes on vegetable diet.

When examined under the microscope, the M. appears as a clear fluid, containing fat globules (the M. globules, as they are usually called) in suspension. They commonly vary from $\cdot 0012$ to $\cdot 0018$ of a line in diameter. They are each invested with a delicate coat of caseine, which prevents their running together. By *churning*, the surrounding envelopes become ruptured, and the contents are made to unite, forming *butter*. In addition to M. globules, colostrum globules (see **COLOSTRUM**), which are irregular conglomerations of very small fat globules, occur in the M. for the first three or four days after delivery of the offspring.

The fatty matters range from 25 to 43 in 1,000 parts of women's M., while in cows' M. they average, according to Lehmann, 45; and in bitches' M., rise to 110. These fatty matters, which collectively form butter, consist of an admixture of 68 per cent. of margarine, 30 per cent. of oleine, and 2 per cent. of an admixture of fats, which, on saponification, yield butyric, caproic, capryllic, and capric acids. The M. which is last yielded is much richer in fat than that first drawn.

The sugar, or lactine (for whose properties, see **SUGAR** [*Milk Sugar*]), varies in human M. from 32 to 62 in 1,000 parts, and in cows' M. from 34 to 43. The M. of bitches, when fed on a purely animal diet, often contains no traces of sugar; but if they are fed on vegetable or mixed food, considerable sugar is found. The salts in women's M. range from 0·6 to 2·5 in 1,000 parts, and in cows' M. from 3·5 to 8·5. That a peculiar selective power is exerted by the mammary gland, is shown by the following table, which shows the comparative analyses of the ashes of cows' M. and of cows' blood, each reckoned for 100 parts:

	Ash of Milk.	Ash of Blood.
Chloride of potassium,	14·18	none
Chloride of sodium,	4·74	38·82
Potash,	23·46	11·44
Soda,	6·96	29·09
Phosphoric acid,	28·40	7·74
Lime,	17·34	1·90
Magnesia,	2·20	0·75

Why the potassium and sodium compounds stand in this inverse relation to one another, in these two fluids, is not known. The abundant supply of phosphoric acid, lime, and magnesia, in the M., is doubtless for the purpose of building up the infant skeleton.

The M. is liable to tolerably regular changes at different periods of lactation—e.g., the sugar is deficient during the first month, and is in excess from the eighth to the tenth month; the caseine is in excess during the first two months, and is most deficient between the tenth and eleventh months; the butter is considerably in excess during the first month, and slightly so for the next two months; while the salts are most abundant during the first month, but present no regular law of decrease.

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Hence, it will readily be seen that, in the selection of a wet-nurse, one of the leading requirements should be, that her M. should be of the same age as that of the mother's. Various medicines—e.g., iodide of potassium, iodide of mercury, and quinine, have been detected in the M., after being taken by the mother; and many cases are on record in which strong mental impressions, as fear or anger, acting on the mother, have so far poisoned the M. as to cause immediate convulsions in the infant.

The daily quantity of M. is dependent on various conditions, such as bodily constitution, food, etc. Lamoignon determined the quantity of M. secreted in definite times by a large number of women, and found as a mean for each breast between 50 and 60 grams (the gram being 15·4 grains) in the course of two hours, assuming that the secretion continues at uniform rate.

In those cases in which a wet-nurse cannot be obtained, it is expedient to modify cows' M., so as to make it resemble that of women. The main differences are, that the former contains more caseine and less sugar and water than the latter. By exposing cows' M. to a gentle heat in a wide, open vessel, a film of caseine is obtained which may be removed (more than once, if necessary); on then adding sugar (sugar of milk, if procurable) and water, a good imitation of the human secretion results.

For the uses of the leading ingredients of the M. in relation to nutrition, see DIGESTION. The M. of cows is extensively used as an article of diet both for healthy persons and for invalids, and it enters largely into all hospital, prison, and work-house dietaries. In patients with a tendency to consumption, or in whom that disease has already manifested itself in its early form, cream is often of great service, especially when the stomach cannot bear cod-liver oil.

For the adulterations to which M. is often subjected, see FOOD: for the instruments used for testing the purity of this fluid, see GALACTOMETER, under GALACTIC. Water is by far the commonest adulteration, and if it has been added in large quantity, the fraud may be detected by evaporating a small weighed quantity of the M. (say 500 grains) to dryness, and ascertaining whether the due proportion of solid constituents is left.

Various methods have been proposed for the preservation of M. for sea-voyages, etc.: the preparations are named Desiccated M., Solidified M., Essence of M., etc. Some of these are well spoken of. But the best process is that which does not prepare from the M. extracts which are not M., but that which, by condensing, preserves the M. itself. Gail Borden, of White Plains, N. Y., devised the process of condensation in vacuum pans, in one of which, with boilers of adequate power, 2,000 qts. per hour can be condensed—the water being thus removed: a little sugar is added, and the product, hermetically sealed, may be kept for an indefinite time. Borden's 'plain condensed M.' has no sugar, and may be kept a few days without hermetical sealing. Condensed

MILK-FEVER—MILL.

M. is now largely used: there are factories in Conn., N. Y., Penn., and other states; also in Switzerland and other European countries.

MILK-FEVER: fever which accompanies or precedes the flow of milk. In the lower animals it comes on within a few days after parturition. One variety, common to most animals, consists in inflammation of the membranes of the womb and bowels, and is produced by exposure to cold, overdriving, or injury during labor; it is treated best with oil and laudanum, tincture of aconite, and hot fomentations to the belly. The other variety, almost peculiar to the cow, attacks animals in high condition, that are good milkers, and have already borne several calves; it consists in congestion and inflammation of the brain and large nervous centres, and impairs all the vital functions, leading to dulness, loss of sensation and motion, and stupor. Blood must be drawn early, while the cow is still standing and sensible. Later, blood-letting only hastens death. A large dose of physic, such as a pound each of salts and treacle, a drachm of calomel, an ounce of gamboge, and two ounces of ginger, should at once be given, solid food withheld, clysters of soap, salt, and water thrown up every hour, cloths wrung out of boiling water applied along the spine, the teats drawn several times daily, and the animal frequently turned. Although treatment is uncertain, prevention is easily insured by milking the cow regularly for 10 days before calving, feeding sparingly on laxative unstimulating food, giving several doses of physic before, and one immediately after, calving; and when the animal is in very high condition, and prone to milk-fever, bleeding her a day or two before calving.

In women, there is a tendency to this fever, but the development is usually very slight, in some cases scarcely noticeable. Its time for appearance is about the third day after parturition, and robust or plethoric women are most affected by it. It usually passes away of itself without special treatment: sometimes saline or other mild laxatives are desirable.

MILL, n. *mīl* [AS. *mylen*; W. *melin*; Dut. *molen*; Ger. *mühle*; Gr. *mulē*; L. *mola*, a millstone or mill; L. *molĕrĕ*; Ger. *mahlen*; Goth. *malan*; W. *malu*, to grind]: a machine in which corn and other substances are ground into meal and flour; a machine for spinning, weaving, sawing, or for performing other operations; the building in which such operations are carried on: V. to grind; to press or stamp, as the edges of coins; to full, as cloth; to cause to froth, as to mill chocolate. **MILL'ING**, imp.: N. the act or employment of grinding; the act of being operated on by machinery; the act of making indented or rough edges on coins; the rough edges thus made. **MILLED**, pp. *mīld*: ADJ. passed through a mill; operated on by machinery; having the edge indented or slightly toothed, as coins. **MILLER**, n. *mīl'ér*, one who keeps or attends a corn-mill; a certain winged insect. **MILL'**

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BOARD, a stout pasteboard made in a mill in the same way as ordinary paper. MILL'-DAM, the barrier of stone and wood placed in the bed of a stream to retain the water and raise its level for the purpose of turning a mill-wheel. MILL'-POND, a reservoir of water to turn a mill. MILL'-RACE, the stream that drives a mill. MILL'-STONE, one of the grinding-stones of a mill (see BUHR-STONE). MILLSTONE-GRIT, a hard gritty variety of Carboniferous sandstone, species of conglomerate extensively used in England for millstones; a division of the Carboniferous system, between the Carboniferous limestone and the Coal-measures. In the Appalachian range in Penn. it is more than 1,200 ft. thick, a coarse siliceous conglomerate; in Va. it is chiefly sandstone, about 1,000 ft. thick; in Ala. it is quartzose, and used for grindstones. MILL'-WRIGHT, one who constructs and repairs mills. MILLED LEAD, *mīld lēd*, lead rolled out into sheets by machinery. TO SEE INTO OR THROUGH A MILLSTONE, to be acute; to be sharp-sighted mentally.

MILL, v. *mīl* [see MILL 1]: in *slang*, to beat severely with the fists; to bruise by boxing with the clenched hands: N. a prize-fight. MILL'ING, imp. MILLED, pp. *mīld*, well pounded or thrashed with the fists.

MILL, n. *mīl* [L. *millē*, a thousand]: in the *United States*, an imaginary money of account, the tenth of a cent, or the thousandth of a dollar.

MILL, in Law: a property carrying certain riparian rights. The owner of a mill situated on the bank of a stream is entitled to the use of the stream undiminished in volume; and if other riparian owners above interfere with the stream by diminishing its volume, thereby causing injury to the mill, the mill-owner has a right of action against them.

MILL, GRIST: machinery for grinding; also manufactory containing such machinery, for reducing grain to meal or flour.

From time immemorial, grain has been ground by a pair of stones. The earliest and rudest hand-mills were, no doubt, somewhat like that shown in fig. 1, a representation of one sent to England by Dr. Livingstone, the African traveller, from the banks of the Shiré, in s. Africa.

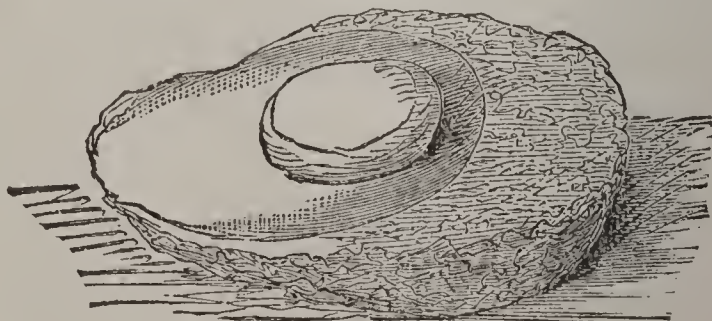


Fig. 1.—African Hand-mill.

He describes it as 'a mill such as Sarah used, when told by her lord to do the thing handsomely and in a hurry

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for the strangers—i.e., a big stone worn hollow by the operations of grinding. The upper stone is grasped by both hands, and the weight of the body brought down on it as it is shoved to the lower part. . . . The meal is made very fine.' The next step in advance of this was the quern or hand-mill, still in use in the Shetland Isles, the Faröes, and other places. The old quern scarcely differs from a pair of modern millstones, except in the stones being small enough to allow of the upper one being turned by the hand, instead of by wind, water, or steam-power.

The millstones now almost universally used for grinding corn or grain are made from buhrstone, a form of silica like flint in hardness, but not so brittle. This rock is found in abundance only in the mineral basin of Paris and some adjoining districts, and belongs to the Tertiary formation. It is of cellular texture, and is frequently full of silicified shells and other fossils. Millstones are usually four to six ft. in diameter, and are each made up of a number of pieces strongly cemented and bound together with iron hoops. One six ft. in diameter, of fine quality, will cost about \$250. The grinding surface of each stone is furrowed or grooved in the manner shown in fig. 2, the grooves being cut perpendicularly on the one side, and with a slope on the other.

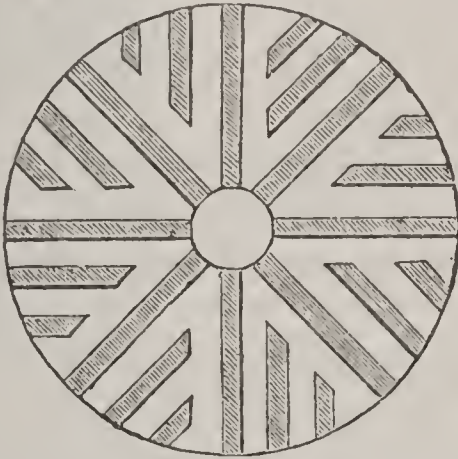


Fig. 2.—Millstone, showing Grinding Surface.

A pair of stones are used together, and both being furrowed exactly alike, the sharp edges of the grooves on the one come against those on the other, and so cut the grain to pieces.

Fig. 3 shows a section of a flour-mill reduced to its simplest elements. The millstones are at *a*, the lower of which is firmly fixed, it being a matter of importance to have this done securely; and the upper is made to revolve, on a shaft which passes up through the lower one, at a speed of one hundred revolutions per minute, more or less. Motion is communicated by the spur-wheel *b*, driven by a water-wheel or other power. The grain, previously cleaned, is supplied to the millstones by means of the hopper *c*, connected with which there is a valve, *d*, for regulating the supply. Passing through a hole in the centre of the upper millstone, it comes in be-

tween the two, where it is ground, and thrown out on all sides by means of the centrifugal force. The millstones are, of course, inclosed, and the flour passes down through the spout *e*, to the worm at *f*, which, while it cools the ground grain, carries it along to elevators *g*. These raise it up to the floor, on which the silk dressing-machine, *h*, is placed. This is a cylinder, which was formerly made of wire-cloth of various degrees of fineness, and consequently separated the flour into different qualities—the finest passing through the first portion, the second passing through the next, and so on; but no

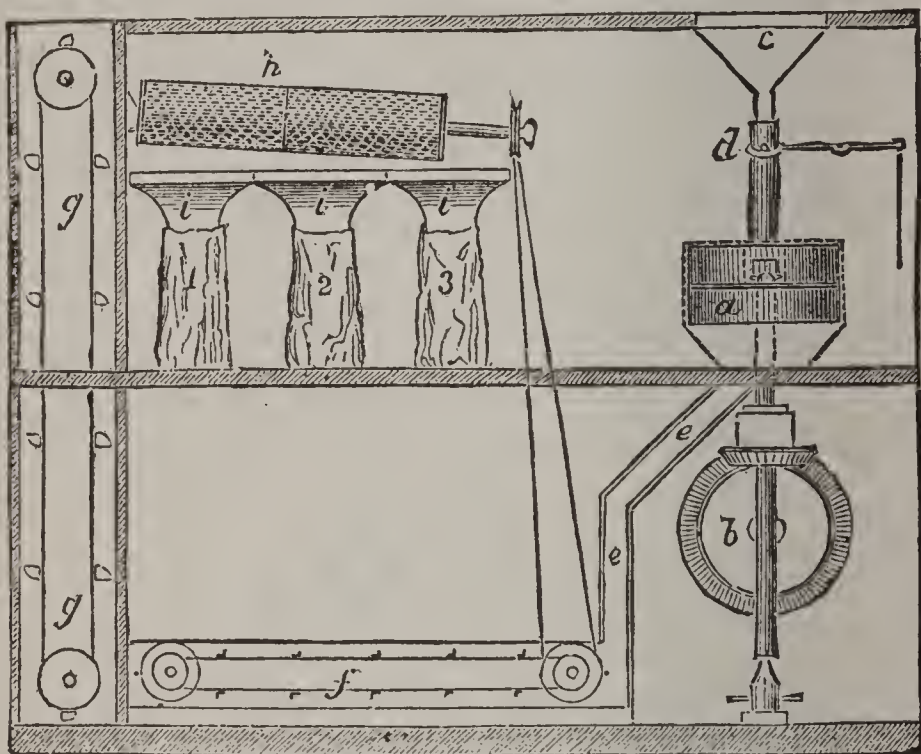


Fig. 3.—Elementary Section of a Flour-mill.

part of it large enough in the openings to let through the bran, which passed out at the end. Silk is now preferred to wire-cloth for dressing the flour. Hoppers, *i*, are placed below the dressing-machine, by means of which the flour and bran are filled into sacks, No. 1 being fine flour; No. 2, seconds; and No. 3, bran.

In a large and well-appointed mill, the wheat passes through a series of cleaning or smut-machines (consisting of rapidly revolving beaters inside an iron case) and through winnowing machines. After being slightly crushed between iron rollers and passed through a wire dressing or sifting machine, the wheat is crushed by 48 pairs (or other adequate number) of millstones. It is then sifted by means of silk cylinders—first to separate the bran, and a second time to separate the ‘middlings’ or ‘parings.’ What falls through the second set of silk machines is finished flour. The middlings are then subjected to a sifting process by means of ‘middlings-purifiers.’ These, which are horizontal sieves, are kept constantly in motion, and through them a current of air is made to pass by the suction of a fan. Thereafter, the middlings are ground by means of porcelain rollers, and

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dressed through silk in the same way as the ground wheat, the flour thus obtained being mixed with that from the millstones. All the machinery is combined by means of elevators and screws in such a way that no manual labor is required for the conveyance of the material, from the time when it enters the mill as wheat to that at which it falls into sacks as flour, the process of manufacture occupying half an hour. One such great mill manufactures about 1,000 sacks of flour per day of 24 hours.

There is a form of mill in use for some purposes where the millstones are vertical, as shown in fig. 4, and called the edge-stone mill. It is sometimes, though rarely, used for grinding grain; but is much employed for crushing oil-seeds and for grinding dye-stuffs, sugar, chemicals, and a multitude of other substances. The stones are generally of some hard rock, such as granite or sandstone, and from 5 to 7 ft. in diameter. For such purposes as grinding clay or loam, they are usually made of cast-iron and of smaller size. The stones revolve in opposite directions, sometimes upon a fixed stone or metal bed, and at other times it is the bed-plate itself which re-

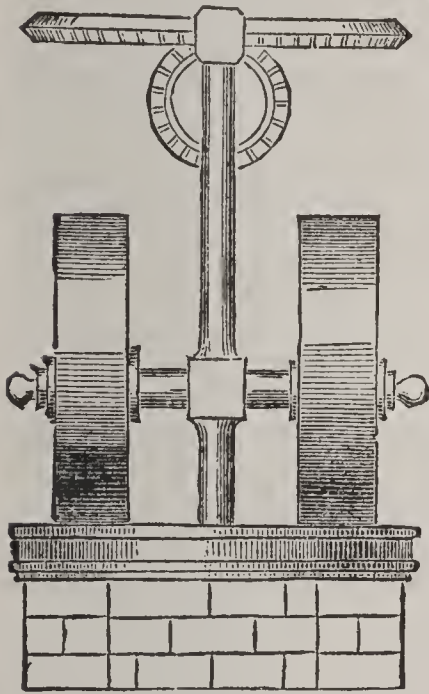


Fig. 4.—Edge-stone Mill.

volves, and in so doing turns the edge-stones which rest upon it.

Among recent improvements in flour-mills are: 1. The high-grinding system by means of rollers—either of chilled iron or of porcelain—in place of stones, suited to hard wheats, and carried out with great success in Hungary, particularly in Buda-Pesth, whence for many years have come the finest qualities of flours. Of late years, the millers of Minnesota have copied this system; and as they are favored by having a similar quality of wheat, they are successfully contesting the European markets with the Hungarians. 2. Middlings-purifiers (mentioned above), which vary very much in construction, but have the same leading principle—viz., making use of the difference of specific gravity of flour and bran, to effect a separation between them. By means of these machines, flour of very fine quality can now be made from material formerly used for feeding purposes. These middlings-purifiers are the leading feature in the American 'New Process' milling, now universally adopted in this country; and it is largely owing to the help of this apparatus that the Americans are now so keenly competing with foreign millers.

MILL, JAMES: historian, political economist, and mental philosopher: 1773, Apr. 6—1836, June 23; b. in the neighborhood of Montrose, Scotland; son of a shoemaker. His mother was ambitious of a career for her son and resolved that he should have an education. He studied, with a view to the ministry, at the Univ. of Edinburgh, where he distinguished himself in Greek and in moral and metaphysical philosophy. He was licensed to preach 1798; but turned from the ministry and went to London 1802, where he settled as a literary man. He became editor of the *Literary Journal*, which after a time was discontinued; and wrote for various periodicals, including the *Eclectic* and the *Edinburgh Review*. In 1806 he commenced his *History of British India*, which with untiring industry he carried on with other literary work, and published in the winter of 1817-8. The impression produced by this masterly history on the Indian authorities was such that, 1819, the court of directors of the company appointed M. assistant-examiner of Indian correspondence, notwithstanding the unpopularity of his well-known radical opinions. The revenue dept. was assigned to his care and he continued its superintendence till four years before his death, when he was appointed head of the examiner's office, where he had control of all the departments of Indian administration—political, judicial, and financial—managed by the secret committee of the court of directors. Shortly after his appointment to the India house, he contributed to the *Encyc. Brit.*, 5th ed., the articles on government, education, jurisprudence, law of nations, liberty of the press, colonies, and prison discipline. These essays were reprinted in separate form, and became widely known. The powers of analysis, of clear statement, and of thorough application of principles, evinced in these articles, had probably never before been brought to bear on that class of subjects, whose treatment had been mainly empirical. In 1821-2 he published *Elements of Political Economy*, prepared primarily with a view to the education of his eldest son, John Stuart M. In 1829, his *Analysis of the Human Mind* appeared. His last published book was *Fragment on Mackintosh*, 1835. He was a contributor to the *Westminster Review* and to the *London Review*, which merged in the *London and Westminster*.

Not long after he settled in London, he made the acquaintance of Jeremy Bentham, and for a number of years lived during the summer in Bentham's country-house. Although he must have derived much benefit from his intercourse with the great law-reformer, he was not a mere disciple of Bentham, but a man of profound and original thought, as well as of great reading, in all departments of moral, mental, and political philosophy. His conversation was impressive, and he gave powerful intellectual stimulus to a number of young men, some of whom (including his own son, and Mr. Grote, historian of Greece) have risen to eminence. He took a leading

part in founding University College, London. He died at Kensington. See *Autobiography of John S. Mill*, the biography by Prof. Bain in *Mind*, 1876-78, and his *James Mill* (1882).

MILL, JOHN, D.D.: about 1645-1707, June 23; b. Shap, Westmoreland, England. He graduated from Queen's College, Oxford, 1669; was tutor there several years, and 1676 was appointed chaplain to the bp. of Oxford. In 1681 he became rector of Blechingdon, Oxfordshire, and chaplain to Charles II. He was appointed 1685 principal of St. Edmund's Hall, which position he held till his death, and 1704 became prebendary of Canterbury, to which office he was nominated by Queen Anne. The great work of his life, which he carried on at his own expense and to which he devoted 30 years, was an edition of the *Greek Testament, with Various Readings*, for which he collected from numerous sources more than 30,000 readings. In two weeks after its completion he died at Oxford. A reprint of his *Testament*, with additional readings, was issued Amsterdam, 1710.

MILL, JOHN STUART: social and political economist, logician, and mental philosopher: 1806, May 20-1873, May 8; b. London; son of James M., who educated him at home on a theory of his own. The boy was taught the Greek alphabet at the age of three, and by his eighth year had read Plato and many Greek books—probably with little real instruction from their contents, but with profitable intellectual discipline. In 1820 he went to France, where he lived for more than a year, making himself master of the French language, and occasionally attending public lectures on science. He lived for some time at Paris, in the house of the French economist, Jean Baptiste Say, where he made the acquaintance of many men distinguished then, or afterward, in letters and in politics. He spent part of his time in s. France, in the house of Sir Samuel Bentham, brother to Jeremy Bentham. During this stay in France, he laid the foundation of his great familiarity with, and interest in, the politics as well as the literature of the French nation. In 1823 he entered the India house, and became a clerk in the examiner's office, where his father was assistant-examiner. For 33 years he continued to be occupied in the dept. of the office named the Political, or the transactions of the E. India company with the native states. In 1831 he was appointed assistant-examiner, and 1856 was placed at the head of the department. He energetically opposed the transfer of the India government to the crown 1858. On account of failing health he declined a seat at the new Indian council, and retired from office 1858, Oct., on a compensating allowance. At the general election of 1865, M. was returned to parliament for Westminster; and till he lost his seat at the election of 1868, he acted with the advanced liberals. He died at Avignon, where he had spent most part of the last years of his life.

M. became an author at a very early age, and is considered one of the foremost thinkers of his time. His first publications were articles in the *Westminster Review*. He was active in the political discussions that followed the revolution of 1830 in France, and the Reform-Bill movement in England; and 1835-40 was editor and, with Sir W. Molesworth, proprietor of the *London and Westminster Review*, where many articles of his own appeared. As political economist and mental philosopher M. may be justly criticised as putting forth various untenable doctrines: his field was very broad, and he was not equally at home in all parts of it—a fact which he failed to note, especially in relation to the deeper spiritual experiences of the human soul. Moreover, his father's assiduous and severe training had been professedly aimed in M.'s childhood to develop in him an intellectual skepticism as his unchanging attitude of thought. Nevertheless his service to political economy has been very great, in setting economic inquiries in their proper scope and their due relations to social and governmental conduct, and in giving political economy such organization as is possible to it on the basis laid by Ricardo. Certainly M. was an earnest intellectual seeker after truth, and a lover of clear thought; and as certainly his handling of any subject gave a profitable stimulus to the whole public mind.—In 1843 he published his *System of Logic*; 1844, *Essays on some Unsettled Questions of Political Economy*; 1848, *Principles of Political Economy*; 1859, essay on *Liberty*; 1860, *Discussions and Dissertations*; 1863, *Utilitarianism*; 1865, *Comte and Positivism*, and the *Examination of Sir William Hamilton's Philosophy*; 1867 (when M. was rector of St. Andrews Univ.), his *Inaugural Address*; 1868, *England and Ireland*; 1869, *The Subjection of Women*. After his death appeared his *Autobiography* (1873), read with intense interest; *Three Essays on Religion* (1874); and a second vol. of *Discussions and Dissertations* (1875). See Bain's *John Stuart Mill*.

MILLAIS, mĭl-lă', Sir JOHN EVERETT, Bart. R.A.: English painter: b. 1829, Southampton. He entered the Royal Acad. at 11, and in 1847 carried off the gold medal for his picture of *The Tribes of Benjamin seizing the Daughters of Shiloh*, exhibited, in the following year, at the British Institution. Before this period, he had acquired reputation among younger painters by his avowed antipathy to the principles of art which then prevailed. His views were shared by other students, such as Holman Hunt, Dante Rossetti (q.v.), and Charles Collins; and a sort of artistic fraternity was formed, which obtained the name *Pre-Raphaelite School*. M.'s principal paintings are: *Our Savior* (1850), *Mariana in the Moated Grange* (1851), *The Huguenot and Ophelia* (1852), *The Order of Release* and *The Proscribed Royalist* (1853), *The Rescue* (1855), *Autumn Leaves* (1856), *The Heretic* (1858), *Spring Flowers* (1860), *The Black Brunswicker* (1861), *My First Sermon* (1863), *My Second Sermon*

MILLAU—MILLEDGEVILLE.

(1864), *Joan of Arc* (1865), *Sleeping, Waking, Jephtha* (1867), *Moses* (1871), *Chill October* (1871), *A Day Dream* (1874), *Sound of Many Waters* (1877), *The Princes in the Tower* (1878), etc. The pre-Raphaelitism, intenseness, and extreme anti-traditionalism of M.'s earliest years were gradually toned down; his mature skill shows remarkable force of color and breadth, though in some recent works there is a lack of motive. His subtle and deeply poetical imagination and his glow of sentiment threw over his works an attractive spell. His influence on portraiture was marked. His portraits of children are very charming. He d. 1896, Aug. 13.

MILLAU', or MILLAUD': see MILHAU.

MILLBURY, *mīl'bér-ī*: town and r.r. junction, Worcester co., Mass.; 6 m. s. of Worcester, 37 m. n. and w. of Providence, with which cities it has r.r. connection. It has five churches, a high school, and two banks. The Blackstone river furnishes abundant water-power for its numerous and varied manufactures. Within the limits of the town are eight cotton and five woolen mills, a foundry, lumber-mills, carriage and whip shops, and manufactories of cutlery, stockings, and shoes. Pop. (1890) 4,428; (1900) 4,460.

MILLEDGE, *mīl'ēj*, JOHN: 1757–1818, Feb. 9; b. Savannah, Ga. He studied law, joined the colonists at the opening of the Revolution, and was one of the party that committed the first overt act of rebellion in the state by capturing the royal gov., Sir James Wright. He rendered excellent service in the army; became atty.gen. of Ga. 1786; served several terms in the legislature, three terms and part of a fourth in congress, and resigned to become gov. of the state; was in the U. S. senate 1806–09, presiding over that body in the latter year. He was one of the founders and benefactors of the state univ. The town of Milledgeville was named for him by authority of the legislature. He died at Sand Hills, near Augusta, Ga.

MILLEDGEVILLE, *mīl'ēj-vīl*: city, cap. of Baldwin co., Ga.; on the Oconee river and the Macon and Augusta and the M. and Eatonton railroads; 85 m. s.e. of Atlanta, 145 m. w.n.w. of Savannah. It is in a beautiful and rich cotton country, is the seat of the state lunatic asylum, the state penitentiary, and the Middle Ga., Milit. and Agricultural College (dept. of the Univ. of Ga.); contains the former state capitol and governor's mansion; had its public buildings burned by Gen. Sherman's army 1864, and was superseded by Atlanta as the state capital 1868. Pop. (1890) 3,322; (1900) 4,219.

MILLEDOLER, *mīl'dol-ēr*, PHILIP, D.D.: 1775, Sep. 22—1852, Sep. 23; b. Rhinebeck, N. Y. He graduated from Columbia College 1793, studied theology, was settled 1795 over the Nassau st. German Ref. Chh., New York, where he preached in German and English; became pastor 1800 of Pine st. Presb. Chh., Philadelphia, and 1805 of the Rutgers st. Presb. Chh., New York. In 1813 he was settled over the Collegiate Ref. Dutch Chh., New York, and remained its pastor till 1825, when he became prof. of theology in the seminary at New Brunswick and pres. of Rutgers College, which offices he held till 1841. He was a powerful preacher and was specially gifted in public prayer. He was prominent in founding the American Bible Soc.; moderator of the Presb. General Assembly 1808, and pres. of the General Synod of the Ref. Church 1823. The last 10 years of his life were spent in retirement. He died on Staten Island, N. Y.

MILLEFOIL: see MILFOIL.

MILLENARY PETITION: see HAMPTON COURT CONFERENCE.

MILLENNIUM, n. *mīl-lēn'ī-ām* [L. *millē*, a thousand; *annus*, a year]: long, indefinite, final period or age (vaguely, a thousand years) in the world's history, which, as some students of the prophetic Scriptures maintain, is to be introduced by the second coming of Christ, who is to administer his kingdom in visible presence on the earth during the millennial age; in which period also Satan will be bound. MILLENARIAN, a. *mīl'lē-nā'rī-ān*, consisting of a thousand; millennial: N. one who believes in the millennium. MIL'LENA'RIANISM, n. *-rī-ān-izm*, doctrine of the millenarians. MILLENARY, a. *mīl'lēn-ār-ī*, consisting of a thousand: N. the space of one thousand years. MILLENNIAL, a. *mīl-lēn'nī-āl*, pertaining to the millennium or one thousand years. MILLEN'NIALIST, n. *-īst*, one who believes that Christ will reign on the earth in visible person for one thousand years.—The *Millennium*, as a period of great advancement, prosperity, and general triumph of the gospel among men, is expected by multitudes who are not millenarians, since they do not accept a principle fundamental in millenarian belief—that the second coming of Christ, with the 'first resurrection' of the righteous dead and the 'translation' of the righteous living, will precede and introduce the millennial reign. As more definitely denoting this millenarian view, it is frequently termed *pre-millenarianism*—with reference to the visible coming of Christ *before* the millennium.

The idea of a M. originated proximately in the Messianic expectations of the Jews; but more remotely, it has been conjectured, in the Zoroastrian doctrine of the final triumph of Ormuzd over Ahriman; and later it was connected by the Christians with the *Parousia*, or second coming of Christ. The notion of a golden age, preserved by the converts from heathenism to Christianity, as well as the oppression and persecutions to

which they were long subjected by the state authorities, would naturally tend to develop and strengthen such hopes. The chief basis of the millenarian idea in Judaism as well as in Christianity, however, is the ardent hope for a visible divine rule upon earth, and the identification of the church with that of which it is merely a symbol. In the 1st c. of the church, millenarianism (the Greek equivalent of which, *chiliasm*, from *chilioi*, a thousand, is the term employed by the Fathers) was a widespread belief, to which the Book of Daniel, and more particularly the pictorial predictions of the Apocalypse (chaps. xx. and xxi.), gave an apostolical authority; while certain prophetic writings, composed at the end of the 1st and the beginning of the 2d c.—e.g., the *Testament of the Twelve Patriarchs*, the *Fourth Book of Esdras*, the *Revelation of St. Peter*, etc.; also the *Christian Sibylline Books*, the *Epistle of Barnabas*, the *Shepherd of the Pseudo-Hermas*, several Midrashim, Targums, and other works partly legendary embodied in the *Talmud*—lent it a more vivid coloring and imagery. The unanimity which the early Christian teachers exhibit in millenarianism proves how strongly it had laid hold of the imagination of the church, to which, in this early stage, immortality and future rewards were to a great extent things of this world as yet. Not only the heretic Cerinthus, but even the orthodox doctors—e.g., Papias, bp. of Hierapolis, Irenæus, Justin Martyr, etc.—delighted themselves with dreams of the glory and magnificence of the millennial kingdom. The *Sibylline Books*, for instance, hold that the earth will be cultivated throughout its length and breadth, that there will be no more seas, no more winters, no more nights; everlasting wells will run honey, milk, and wine, etc. Papias, in his collection of traditional sayings of Christ (*Kuriakōn Logiōn Exēgēseis*), indulges in the most monstrous representations of the rebuilding of Jerusalem, and the colossal vines and grapes of the millennial reign. Every vine will bear 10,000 branches, every branch 10,000 shoots, every shoot 10,000 sprigs, every sprig 10,000 bunches, every bunch 10,000 berries, every berry 36 times 25 gallons of wine; and if a saint come to pluck a berry, they will all cry out: ‘Pluck me, O Saint, I am better, and praise the Lord through me.’ The *Talmud* calculates the height of the men of the M. to be, as before the Fall, 200–900 yards; the moon shall be, according to a prophetic dictum, like the sun; the sun shall be increased 343 times; and every Israelite will beget as many children as there were Israelites going out from Egypt—60,000. Each grape will be large enough to fill the biggest ship. Above all, however, the land of Israel will be free again, and the primitive worship restored with unheard-of splendor. ‘Such a chiliasm,’ Neander justly remarks, could only ‘promote a fleshly eudaimonism;’ and, indeed, ere long it called into more energetic activity the opposition of Gnostic spiritualism. According to the general opinion, which was as much Christian as

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Jewish, the M. was to be preceded by great calamities, reminding us in some degree of the Scandinavian Ragnarök (or 'Twilight of the Gods'). The personification of evil appeared in *Antichrist*, the precursor of Christ (identified, during the 1st c., with Nero), who would provoke a frightful war in the land of Magog (Ezek. xxxviii., xxxix.), against the people Gog, after which the Messiah—some say a double Messiah: one, the son of Joseph, vanquished in the strife (see MESSIAH); the other, the victorious son of David—would appear, heralded by Elias, or Moses, or Melchizedek, or Isaiah, or Jeremiah, and would bind Satan for a thousand years, annihilate the godless heathen or make them slaves of the believers, overturn the Roman empire, from the ruins of which a new order of things would spring forth, in which the 'dead in Christ' would arise, and with the surviving saints enjoy an incomparable felicity in the city of the 'New Jerusalem,' which was expected to descend literally from heaven. To the innocence which was the state of man in Paradise, there were added, in the prevalent notions of the M., the finest physical and intellectual pleasures.

In the Mosaic account of creation, we find the primitive ground for making the victorious era of the church last a thousand years. That account was regarded by the Jews and by the Judaic Christians as a type of the destinies of creation. Now, by a strictly literal interpretation of the 4th verse of Ps. xc., it was supposed that a day of God was arithmetically equal to a thousand years; hence the six days of creation were understood to indicate that the earth would pass through 6,000 years of labor and suffering, to be followed by a seventh day—i.e., 1,000 years of rest and happiness. In the Book of Revelation (xx.) this view is presented. Still, the rabbinical traditions differ widely among themselves as to the duration of the happy period. Instead of 1,000 years, some of them count 40, 70, 90, 365, 400, 600, 2,000, or 7,000, or so many years as have elapsed from the creation of the world or the flood. The Gospel of Nicodemus makes it 500 years, etc. In fact, the systems of apocalyptic chronology were of varied and arbitrary cast, according as their originators laid greater stress on the Apocalypse, the Book of Daniel, the Song of Songs, the Jewish 'Gematria,' or Computation of Letters—a very pliable art in itself—or on astronomy, astrology, 'natural phenomena,' and the like.

The lapse of time, chilling the ardor of the primitive Christian belief in the nearness of the *Parousia*, had without doubt also the tendency to give a more shadowy, and therefore a more spiritual, aspect to the kingdom over which the expected Messiah was to reign. The influence of the Alexandrian philosophy contributed to the same result. Origen started the idea that, instead of a perpetual opposition of paganism to Christianity—instead of a final and desperate conflict between the two—instead of an insolent triumph on the part of the saints, and a

servile submission on the part of the unbelievers, the real progress and victory of Christianity would consist in the gradual spread of the truth throughout the world, and in the voluntary homage paid to it by all secular powers. This was an immense advance on the views previously entertained. It is owing largely to Origen and his disciple Dionysius that more spiritual conceptions of the M. finally established themselves in the church; at all events, they furnished the Fathers with the majority of their arguments. Yet even in the Egypto-Alexandrian Church, millenarianism in its most literal form (not the more spiritualized millenarianism which in our day expresses the longing hope of many eminent Christians) was widely diffused, and was eradicated only by the great wisdom and moderation of Dionysius. The Montanists (q.v.) generally, as might be expected from the enthusiastic tendencies of the sect, were extreme millenarians or chiliasts, and, being considered a heretical sect, contributed largely to bring Chiliasm into discredit; or, at all events, their own carnal form of chiliasm, which Tertullian himself attacked. Caius, the presbyter, in his *Disputation* against the Montanist Proclus, traces the origin of that form to the hated heretic Cerinthus, whom he accuses of forging a certain revelation, which he passed off as the work of an apostle. From his description of this revelation, it is almost certain—strange as it may appear—that Caius is alluding to the canonical Apocalypse. Lactantius, in the beginning of the 4th c., was the last important church Father who indulged in chiliastic dreams; among its earlier advocates were Nepos, Methodius, Korakion, Apollinarius, Victorinus, etc. In the 5th c., St. Jerome and St. Augustine expressly combated certain fanatics who still hoped for the advent of a millennial kingdom whose pleasures included those of the flesh. But from this time the church formally rejected millenarianism in its sensuous ‘visible’ form, though the doctrine every now and then made its reappearance suddenly and obstinately, especially as a general popular belief. Thus the expectation of the *Last Day* in the year 1,000 reinvested the doctrine with a transitory importance; but it lost all credit again when the hopes so keenly excited by the Crusades faded away before the stern reality of Saracenic success, and the predictions of the *Everlasting Gospel*, a work of Joachim de Floris, Franciscan abbot (died 1212), remained unfulfilled.

At the period of the Reformation, millenarianism once more experienced a partial revival, because it was not difficult to apply some of its symbolism to the papacy. The pope, e.g., was *Antichrist*—a belief still retained in some extreme Protestant creeds. Yet the doctrine was not adopted by the great body of the Reformers, but by some fanatical sects, such as the Anabaptists, and by the Theosophists of the 17th c. Also during the civil and religious wars in France and England, when excitement prevailed, it was prominent. The *Fifth Monarchy Men*

of Cromwell's time were millenarians of the most exaggerated and dangerous sort. Their peculiar tenet was, that the *M.* *had* come, and that *they* were the saints who were to inherit the earth. The excesses of the French Rom. Cath. mystics and Quietists terminated in chiliastic views. Among the Protestants, it was during the 'Thirty Years' War that the most enthusiastie and learned chiliasts flourished. These may—broadly—be brought under the three chief heads of *Exegetical* Chiliasts, who, by some biblieal dates, endeavored to compute the predicted time; *Alchemistic* or *Cabalistic* Chiliasts, who endeavored to hasten the period by some mystical discovery; and *Politico-theocratic* Chiliasts, who wished to reduce the governments of the world to a biblieal standard: see ANABAPTISTS: MÜNZER. The awful suffering and widespread desolation of that time led pious hearts to solace themselves with the hope of a peaceful and glorious future. Since then the predilection which has sprung up for expounding the prophetic books of the Bible, and particularly the Apocalypse, with a view to present events, has given the doctrine a faint semi-theological life, very different, however, from the earnest, practical faith of the first Christians. Among the foremost chiliastic teachers of modern centuries are Ezechiel Meth, Paul Felgenhauer, Bp. Comenius (*Lux in Tenebris*, 1657), Prof. Jurieu (*L'Accomplissement des Prophéties*, 1686), Serarius (*Assertion du Regne de Mille Ans, etc.*, abt. 1670), Poiret (*Economie Divine*, 1687), J. Mede (*Clav. Apocal*, 1627). Thomas Burnet and W. Whiston endeavored to give chiliasm a geological foundation, but without finding much favor. Spener, on account of his *Hoffnung besserer Zeiten*, has been deemed a chiliast; no less Joaehim Lange (*Licht und Recht*); and Swedenborg employed apocalyptic images to set forth the transfigured world of the senses. Latterly, especially since the rise and extension of missionary enterprise, the opinion has obtained wide currency that, after the conversion of the whole world to Christianity, a blissful and glorious era will ensue; but not much stress—except by extreme literalists—is now laid on the nature or duration of this far-off felicity. In fact, the common vague Christian conception of a *M.* without a visibly present Christ, as held at the present day, is little different, so far as results are concerned, from the belief of philosophers in the perfectibility of the race. The essence of both conceptions is the cessation of sin and sorrow, the prevalence of holiness and happiness. But this departs widely from the 'ancient hope of the church'—a kingdom of visible majesty, with Jesus and the saints ruling the world from Jerusalem, the central city of the earth.

In quite recent years an enthusiastie millenarianism of the more spiritual type has seized on some men in Britain, and still more in the United States, who are held in high honor in their various denominations. What they lack in numbers, they make up in fervor. At least their argument and appeal have done the modern church

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this service—they have called attention to a range of sublime but dim truths which have become an almost forgotten heritage from the early church. It is probable that the great body of Christian thinkers on this theme are not at rest in either the common or the millenarian theory. Probably, in the words of a recent writer, 'it is felt that while the strict pre-millennial view, from a flat literal interpretation of a few texts, tends toward an external and materialistic handling of noble spiritual facts, the opposite and usual view tends toward dissolving all spiritual facts in a vast sea of symbolism, and this on a principle of interpretation by which almost any words in Scripture can be turned to almost any meaning. The usual expedient of seeking a third view carefully limited between the two extremes, and antagonizing both, seems scarcely feasible in this case. The truth, when found, will probably be not between, but *combining*, both—not so much rejecting either as solvent and comprehensive of both in some more vital range of thought.'

Great eagerness and not a little ingenuity have been exhibited by many persons in fixing a date for the commencement of the M. The celebrated theologian, Johann Albrecht Bengel (*Erklärte Offenbarung: Reden für's Volk*), who, in the 18th c., revived an earnest interest in the subject among orthodox Protestants, asserted from a study of the prophecies that the millennium would begin 1836. This date was long popular. Bengel's general millenarianism was adopted by Oetinger (d. 1782), and widely spread throughout Germany, in a more or less poetic form, by Hahn, Crusius, Jung Stilling, Lavater, and Hess (*Briefe über die Offenb. Joh.*). Some of the greatest of the more recent German theologians are millenarians, such as Rothe, Delitzsch, Hoffmann, Kurtz, Hebart, Thiersch, Nitzsch, P. Lange, and Ebrard. Swedenborg held that the last judgment took place 1757, and that the New Church, or 'Church of the New Jerusalem,' as his followers designate themselves—in other words, the millennial era, then began. In the United States considerable agitation was excited by the preaching of William Miller (q.v.), who fixed the second advent of Christ about 1843. Of late years, the most noted English millenarian was Dr. John Cumming, who originally placed the end of the *present dispensation* 1866 or 7; but as that time drew near without any millennial symptoms, he was understood to have modified his original views considerably, and came to the belief that the beginning of the M. will not differ so much, after all, from the years immediately preceding it as people commonly suppose. See Corrodi's *Kritische Geschichte des Chiliasmus* (Zurich, 1794, 4 vols.); Calixtus, *De Chiliasmo* (1692, 4to); Klee, *De Chiliasmo* (1825); Schürer's *Neutestamentliche Zeitgeschichte* (1874); and the standard handbooks of the history of Dogma. A really good history of millenarianism, however, is as yet a desideratum.

MILLEPEDE—MILLER.

MILLEPEDE, n. *mĭl'lē-pēd*, **MILLEPEDES**, n. plu. *mĭl'lē-pēdz* or *mĭl-lēp'ē-dēz* [L. *millē*, a thousand; *pedem*, a foot]: popular name of many kinds of *Myriapoda*, of order *Chilognatha*, and chiefly of families *Julidæ* (see **JULUS**) and *Polydesmidæ*. In the latter family, the feet are arranged in numerous groups along both sides; otherwise they much resemble the *Julidæ*. The largest species of these articulate animals are found in warm climates, and some are brightly colored; but small species of both families are common in temperate regions, and some, as *Polydesmus complanatus*—which is lilac-colored, flattened, and from a quarter to half an inch in length—are very destructive to roots of plants. Doubt has been expressed if they attack roots perfectly healthy; but, at all events, they take advantage of incipient decay, and greatly extend and accelerate it. The application of salt, lime, nitrate of soda, etc., has been often recommended as preventive of their ravages.—The name **PILL M.** is often given to those shorter *Chilognatha*, of the family *Glomeridæ*, which, when disturbed, roll themselves up into an almost globular form, like the crustacean called armadillo. *Note*.—The *millepede* has two pair of limbs to each joint; the *centipede* has but one.

MILLEPORA, n. plu. *mĭl'lē-pō'ră*, or **MIL'LEPORI'DÆ**, n. plu. *-rĭ'dē*, and **MIL'LEPORES**, n. plu. *-pōrz* [L. *millē*, a thousand; *porus*, a pore]: in *geol.*, genus and family of hydrozoa, contributing largely to the formation of branching corals, whose cells or pores are extremely numerous and minute. **MIL'LEPO'RITE**, n. *-rĭt*, a fossil millepore.—*Millepores* are by recent observers thought to be of two kinds of animals: the larger, gastrozooids, occupy the larger tubes of the coral skeleton; the smaller, dactylozooids, occupy the smaller tubes around the larger. The smaller have no mouth, but with their tentacles they catch food for the larger, which have mouth and stomach, and who digest for the whole colony a nutritive fluid which is then distributed to every part by a ramifying system of minute ducts.

MILLER: see under **MILL 1**.

MILLER, *mĭl'ēr*, **CININNATUS HEINE** (known as **JOAQUIN MILLER**): b. Cincinnati, O., 1841, Nov. 10. His father, who had been unsuccessful as a merchant, became a farmer, and 1849 went with his family to Oregon, the trip occupying two years and involving many hardships. A settlement was made in the forest. Here young M. worked till 1854, when he ran away to the California mines, encountered many difficulties, and was captured by the Modoc Indians, with whom he fought against the whites. When the Modocs were defeated, M. escaped and was a short time with Walker in Nicaragua, returned to Oregon and studied law, edited 1862 a newspaper, which was suppressed by the govt., married 1863, was county judge 1866–70, and wrote a few poems. In the latter year he went to Europe, where he continued writing, but could find no publisher for his poems, and

finally printed an edition in London at his own expense, which quickly brought him wealth and fame. Domestic troubles resulted in a divorce obtained by his wife 1871. After returning from Europe, M. spent some time in Washington and New York, and returned to California 1887. Among his numerous published works are *Pacific Poems*, *Songs of the Sierras*, *Songs of the Sun Lands*, *Ship in the Desert*, *Songs of Italy*, *Unwritten History*, and two novels, *First Families of the Sierras* and *One Fair Woman*; besides several successful plays. D. 1903, May 10.

MIL'LER, EDWARD, M.D.: 1760, May 9—1812, March 17; b. Dover, Del. He obtained a medical education at the Univ. of Penn. and in a hospital at Basking Ridge, N. J.; served in the revolutionary war as surgeon's mate; went to France 1782 on a war-vessel, and practiced medicine 1783-96 in Dover. In the latter year he removed to New York, where 1799 he became one of the founders of the *Medical Repository*, the first medical journal published in America. He was appointed New York city physician 1803, medical prof. in the Univ. of New York 1807, and clinical lecturer in the New York Hospital 1809. He assisted his brother, the Rev. Samuel M., in the preparation of a *Brief Retrospect* published by the latter, and wrote a *Report on the Yellow Fever in New York in 1805*, in which he claimed that the disease is non-contagious, and which still holds a high place in medical literature. He was a strong temperance advocate and earnestly opposed the use of tobacco in any form. As a practitioner he was one of the most successful of his time. He died at New York. His medical works, edited by his brother, who also furnished a biographical sketch, were published 1814.

MIL'LER, HENRY: 1751, Feb. 12—1824, Apr. 5; b. near Lancaster, Penn. He was admitted to the bar when about 20 years of age, joined the continental army 1775, with a company which he had helped organize and of which he was 1st lieut., reached Cambridge July 25, and rendered efficient service. He was promoted capt., was prominent at the battle of Long Island, made maj. 1777, and the following year lieut.col. He took part in about 50 battles. He retired from the army 1779, on account of the financial troubles of his family, was high sheriff of York co. 1780-83, served in the Pennsylvania legislature 1783-85, and was a member of the state constitutional convention 1790. In 1794 he was appointed quartermaster-gen. of the expedition against the whisky in surrection. He afterward became a merchant in Baltimore, and in the war of 1812 was commissioned brig.-gen. Returning to Penn., he was prothonotary of Perry co. 1821, till he died at Carlisle.

MIL'LER, HENRY, M.D.: 1800, Nov. 1—1874, Feb. 8; b. Lexington, Ky. He was educated at Lexington, where he obtained a license as a physician; practiced medicine a short time in Glasgow, and then removed to Harrodsburg. Here he remained till the opening of the medical univ. in Louisville, in which 1835–69 he was prof. of obstetrics and the diseases of women and children. In the latter year he was made prof. emeritus. He was elected 1859 pres. of the American Medical Assoc. His books, *A Treatise on Human Parturition*, 1844, and *The Principles and Practice of Parturition*, 1858, were accepted as standard publications. He contributed many valuable articles to the medical journals of the day. Dr. M. died at Louisville.

MIL'LER, HUGH: distinguished geologist and most graceful and genial writer: 1802, Oct. 10—1856, Dec. 23–24; b. Cromarty, in n. Scotland; descended from a family of sailors, and losing his own father by a storm at sea when he was only five years of age. In consequence of this misfortune, he was brought up chiefly under the care of two of his mother's brothers, one of whom ('Uncle Sandy') imbued him with a taste for natural, and the other ('Uncle James') for traditional history. He acquired good knowledge of English at Cromarty Grammar School. Before his 11th year he had read those romances of childhood, *Jack the Giant-killer*, *Jack and the Bean-stalk*, *Sindbad the Sailor*, *The Yellow Dwarf*, and *Aladdin and the Wonderful Lamp*, besides several works of higher literary pretensions. As he grew older, he became extremely fond of the great English poets and prose writers. From his 17th to his 34th year, he worked as a common stone-mason, devoting his leisure hours, chiefly in the winter months, to independent researches in natural history, to the extension of his literary knowledge, and to writing, for which he had a passion. In 1829 he published a volume, *Poems written in the Leisure Hours of a Journeyman Mason*, followed after a few years by *Scenes and Legends of the North of Scotland*. M. soon decided that poetry was not his field. His attention was soon drawn to the ecclesiastical controversies which were agitating Scotland, and his famous *Letter to Lord Brougham*, on the 'Auchterarder Case,' brought him into public notice. In 1840 he went to Edinburgh as editor of the *Witness*, a newspaper started in the interest of the non-intrusion party in the Church of Scotland; and, in the course of the same year, published in its columns a series of geological articles, afterward collected under the title of *The Old Red Sandstone, or New Walks in an Old Field*. These articles were very remarkable, both in a scientific and literary view. They contained a minute account of the author's discovery of fossils in a formation believed, until then, to be destitute of them, and written in a style which was a rare and harmonious combination of strength, beauty, and polish. At the meeting of the British Assoc. in the same year (1840), he was warmly praised by Murchison and Buckland; in-

deed, his discoveries were the principal topic of discussion among the savants. His editorial labors during the heat of the Disruption struggle were immense, and so seriously injured his health that for some time he had to give up literary activity. About 1846 he resumed his pen, and became the most vigorous and eloquent writer in the service of the newly constituted Free Church. After ten years of hard, fagging toil, his brain gave way, and, in a moment of aberration, he put an end, by a pistol-shot, to his own existence, at Portobello, near Edinburgh. M.'s principal works, besides those above mentioned, are: *First Impressions of England and its People*; *Footprints of the Creator, or the Asterolepis of Stromness*, designed as a reply to the *Vestiges of the Natural History of Creation*; *My Schools and Schoolmasters, or the Story of my Education* (greatly admired); and *Testimony of the Rocks*, an attempt to reconcile the geology of the Pentateuch with the geology of nature, by the hypothesis that the days mentioned in the first chapter of Genesis represent not the actual duration of the successive periods of creation, but only the time occupied by the unrolling of a directly inspired panoramic vision of these periods before the eyes of Moses.

M.'s services to science were great, but he is even more distinguished as a man of genius and as one of the best writers of his time. Of *The Old Red Sandstone*, Buckland said that 'he would give his left hand to possess such powers of description as this man.' As a man, he was honest, high-minded, earnest, and hugely industrious, a true Scot, a hearty but not a sour Presbyterian (for he loved Burns as much as he revered Knox). Scotland may well be proud of 'the stone-mason of Cromarty.' Besides his autobiography quoted above, see *Life* by Peter Bayne (2 vols. 1871).

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MIL'LER, JAMES: 1776, Apr. 25—1851, July 7; b. Peterborough, N. H. He obtained a legal education, became maj. in the U. S. army 1808, and lieut.col. 1810. He was made brevet-col. for gallant service as commander at the battle of Brownstown; was prominent in the battles of Fort George, Chippewa, and Lundy's Lane, by a brilliant assault deciding the latter conflict in favor of the Americans. As a recognition of his services in the war of 1812, he was breveted brig.gen., and was presented with a gold medal by congress. He was gov. of the territory of Ark. 1819-25, and from the latter date to 1849 was collector of the port of Salem, Mass. He died at Temple, N. H.

MIL'LER, JOAQUIN: see MILLER, CININNATUS HEINE.

MIL'LER, JOHN FRANKLIN: 1831, Nov. 21—1886, Mar. 8; b. South Bend, Ind. He studied law, and from 1855 practiced in South Bend, and entered politics. He resigned 1861 the position of state senator, entered the Union army, organized a regt., was repeatedly promoted for gallant service, and became brevet-maj.gen. of vols. 1865. He was collector of the port of San Francisco, organized the Alaska commercial fur company, served three times as repub. presidential elector, was member 1879 of the Cal. constitutional convention, and from 1881 till his death was a prominent member of the U. S. senate. He died in Washington.

MIL'LER, JOSEPH: jester: known as JOE MILLER (q.v.).

MIL'LER, SAMUEL, D.D.: 1769, Oct. 31—1850, Jan. 7; b. Dover, Del. After graduating from the Univ. of Penn. 1789, he studied theology, received a license to preach 1791, and became 1793 a colleague of Drs. Rodgers and McKnight in the pastorate of the 1st Presb. Church in New York. He was prof. of eccles. history 1813-49 in the Princeton Theol. Seminary. He was one of the leading men in his denomination, a prolific author, an uncompromising Calvinist, and was prominent in the discussions which preceded the division of the Presb. Church into the old and new schools. Although much of his writing was controversial, he was uniformly kind and courteous. Among his published works were *A Brief Retrospect*, in the preparation of which he was assisted by his brother, EDWARD M. (q.v.); *Letters on Unitarianism*, *Letters on Clerical Manners and Habits*, *Letters to Presbyterians*, and the *Life of Jonathan Edwards*, in Sparks's *American Biography*. He died at Princeton.

MIL'LER, SAMUEL FREEMAN: 1816, Apr. 5; b. Richmond, Ky. He studied medicine at Transylvania Univ.; practiced eight years, studied law, and on account of his anti-slavery sentiments removed to Iowa 1850, where he gained high rank as a lawyer, was an active republican, but declined various public offices. He was appointed 1862, by Pres. Lincoln, associate-justice of the supreme court of the U. S., and was for many years the senior jus-

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tice in service. He delivered the oration, Philadelphia 1887, at the centennial celebration of the adoption of the national constitution. D. in Washington, Oct. 13, 1890.

MIL'LER, WARNER: 1838, Aug. 12; b. Oswego co., N. Y. He graduated from Union College 1860, taught in Fort Edward Collegiate Institute, enlisted as a private in the Union army 1861, was taken prisoner at the battle of Winchester, paroled, and in a short time honorably discharged. He visited Europe, and on his return engaged in the manufacture of paper in Herkimer, N. Y. He was a delegate to the repub. national convention 1872, member of the state assembly 1874-78, and of the lower house of congress 1878-81. In the latter year he succeeded Thomas C. Platt, who had resigned, in the senate, and served till the expiration of the term, 1887. He was defeated 1888 as repub. candidate for gov. of N. Y., and was elected pres. of the Nicaragua Canal Construction Co. 1890, Mar. 6.

MIL'LER, WILLIAM: 1782, Feb. 5 — 1849, Dec. 20; b. Pittsfield, Mass.: founder of the religious sect known as 'Adventists,' formerly 'Millerites,' His education was limited, but he became a successful farmer and held the offices of justice of the peace, constable, and sheriff, and was capt. of vols. in the war of 1812. He accepted infidel doctrines, but soon renounced them, became a Baptist, and engaged in a close study of the Bible, with no aid except a concordance. After some years he announced that he had found a key to the prophecies, and, about 1833, he began to lecture on the second coming of Christ, which he asserted would occur within one year from 1843, Mar. 21. He obtained a license to preach, but was never ordained. Some 50,000 people accepted his doctrines. The failure of fulfilment of his prophecy was charged to an error in computation, and he continued to look for the speedy coming of the Lord. He called a convention 1845, April 25, at which his followers took the name Adventists (q.v.). He died at Low Hampton, N. Y.

MILLERITE, n. *mīl'ér-īt* [after Professor *Miller*, of Cambridge]: a mineral, sulphate of nickel, occurring in delicate six-sided prisms of a bronze yellow.

MIL'LERITES: peculiar millenarian sect: see MILLER, WILLIAM (1782-1849): also SEVENTH-DAY ADVENTISTS.

MIL'LER'S THUMB: see BULLHEAD.

MILLESIMAL, a. *mīl-lēs'ī-māl* [L. *millesimus*, the thousandth—from *millē*, a thousand]: consisting of thousandth parts. MILLESIMALLY, ad. *-lī*.

MILLET.

MILLET, n. *mīl'lèt* [F. *millet* or *mil*—from L. *mīllūm*: millet]: grain-bearing plant, consisting of a jointed stem having a large head containing abundance of small edible grains; of species of *Panicum*, *Setaria*, and allied genera. The genus *Panicum* contains many species, natives of tropical and warm temperate countries, and some of which, as *Guinea Grass* (q.v.), are among the largest fodder grasses. The flowers are in spikes, racemes, or panicles; the glumes very unequal, one of them often very minute; each spikelet containing two florets, one of which is often barren. The genus *Setaria* has a spike-like panicle, with two or more bristles under the glumes of each spikelet.—COMMON M. (*Panicum miliaceum*) is an annual grass, three or four ft. high, remarkably covered with long hairs, which stand out at right angles. It has a much-branched nodding panicle; the spikelets are oval, and contain only one seed. It is a native of the E. Indies, but is extensively cultivated in the warmer parts of Europe and other quarters of the world. It succeeds only in those climates in which wine can be produced. It is called, in India, *Warree*, *Cheena*, and *Kadi-kane*. The grain, which is very nutritious, is only about one-eighth of an inch in length. It is used in the form of groats, or in flour mixed with wheat-flour, which makes a good kind of bread; but bread made of M. alone is brittle and full of cracks. Poultry are extremely fond of M. The straw is used for feeding cattle.—Other species, *P. miliare*, *P. frumentaceum*, and *P. pilosum*, are cultivated in different parts of India, chiefly on light and rather dry soils, yielding very abundant crops.—GERMAN M., or MOHAR (*Setaria Germanica*), and ITALIAN M. (*S. Italica*), regarded by many as varieties of one species, and probably originally from the East, though now naturalized in s. Europe, are cultivated in many warmer parts of Europe, in India, and other countries. Italian M. is three or four ft. in height: German M. is much dwarfer, and its spike comparatively short, compact, and erect; and less valuable as a grain-plant. The grains of both are very small, only about half as long as that of Common M.; but they are extremely prolific, one root producing many stalks, and one spike of Italian M. often yielding two ounces of grain. The produce is estimated as five times that of wheat. Italian M. is called, in India, *Koongoonie*, *Kalakangnee*, and *Kora-kang*. The grain of these millets is exported for feeding cage-birds, and for use as a light and pleasant food, though for this purpose it is little used in Britain and the United States, while it is extensively used in soups, etc., in s. Europe. It does not make good bread. To the same tribe of grasses belong the genera *Paspalum*, *Pennisetum*, *Penicillaria*, *Digitaria*, and *Milium*—species of which are cultivated in different parts of the world for their grain. *Paspalum exile* is the *Fundi* (q.v.) of Africa; and *P. scrobiculatum* is the *Koda* of India, where it is cultivated chiefly on poor soils. *Penicillaria spicata*, or *Pennisetum typhoid-*

MILLET.

um, is extensively cultivated in Africa and to a considerable extent in India. Its cultivation has been introduced into s. Europe. It thrives best on light soils. Its Indian name is *Bajree*. It often receives the names EGYPTIAN M. and GUINEA CORN (q.v.). It has a somewhat spiked cylindrical panicle.—*Pennisetum distichum* abounds in central Africa, on the s. borders of the Great Desert, where it is called *Uzak*, and is described by Barth as causing much inconvenience to the traveller, the little bristles which are attached to its seeds making them stick like burs to the clothes; they also pierce the skin and cause sores, so that it is necessary to be provided with small pincers for their extraction, and none even of the wild roving natives is ever without such an instrument. But its seed is a common and pleasant article of food, in some places the principal food of the people, and a pleasant beverage is made from it.—*Digitaria sanguinalis* is called POLISH M., being cultivated in cottage-gardens in Poland, where the grain is used like rice. It is a common grass in many parts of Europe, though very rare in Britain. The spikes in this genus are compound, and from their appearance give it the names *Digitaria* and *Finger-grass*.—The M. GRASS (*Milium effusum*) of Britain, occasionally found in shady woods, is a very beautiful grass, 3 or 4 ft. high, with a spreading pale panicle of small flowers; and has been much recommended for cultivation as a forage grass, and for its very abundant small seeds, excellent food for game. Another species of the same genus (*M. nigricans*) is the *Maize de Guinea* of Peru, where its seeds, after being dried by heat, are converted into a very white flour, a pleasant article of food; and a beverage called *ullpu* is made from them.—The name INDIAN M. is sometimes given to *Durra* (q.v.), but it belongs to a different tribe of grasses from the true millets.

MILLET, *me-yǎ'*, AIMÉ: sculptor: b. 1816, Paris; studied painting under his father, and sculpture under David d'Angers. He began to exhibit 1842, and 1857 became famous by his *Ariadne*, which the French govt. bought for the museum of the Luxembourg. His statue of *Mercury*, exhibited 1859, and placed in the court of the Louvre; *Vercingetorix*, a colossal figure in bronze; *Apollo*, which crowns the grand opera-house in Paris; his work on the tomb of Henry Murger; his monument to Baudin in Père la Chaise, and statue for Léon Dupré's monument to the guards of the dept. of Eure who fell in the war of 1870-1, are his chief works. Great knowledge of the human figure, and skill in molding it, are shown in all his productions.

MILLET, *mīl'ët*, FRANCIS DAVIS: painter: b. 1846, Nov. 3, Mattapoissett, Mass. He graduated at Harvard 1869, studied art at Antwerp, gained honors there 1872-3, painted in Belgium, Italy, England, France, and Austria, and settled in New York. He served as art juror in the Vienna world's fair, 1873; and during the Turko-Russian war, 1877-8, was correspondent of the London

MILLET—MILLIMETRE.

Daily News. At the Paris Exposition, 1878, he was a fine-arts juror. He gained a medal at New Orleans 1885, and a prize of \$2,000 from the Amer. Art Assoc. 1886. His paintings include landscapes, figures, and portraits, and his literary work a translation of Tolstoi's *Sebastopol*, 1887.

MILLET, *mê-yâ'*, JEAN FRANÇOIS: French painter: 1814, Oct. 4—1875, Jan. 20; b. Gréville (Manche). He studied under Mouchel and Langlois at Cherbourg, and Delaroche in Paris; began exhibiting 1844, and till 1848 executed pictures marked by rough vigor; but from 1849 his style changed, and he became a painter of pastoral pieces of great refinement in thought and execution. A peasant himself in origin, his representations of lowly and simple peasant life were wonderfully natural and touching; and in his limning of the fields, with scenes of labor or of animal life, he rose to the highest distinction as a landscape and figure painter. The pictures of his first style were *Milkmaid*, *Lesson in Riding*, *Œdipus*, and *Jews at Babylon*. In 1849 he began, in the style of his best work, with *The Sower*, and in the ten years following produced *Country Woman Seated*, *Men Binding Wheat*, *Shepherds*, *Harvesters*, *Clipping Sheep*, *Grafter* (which brought at a sale [1881] 133,000 francs), *Gleaners*, *Angelus*, *Death and the Woodcutter*, and *Woman with a Cow*. A score of other important works were brought out 1860–70, and after M.'s death 56 pictures and studies, many unfinished, remained in his studio, and were sold for 321,034 francs. The popularity of his pictures has caused them to be extensively engraved and widely dispersed; and a large number of the originals are owned in the United States. The *Angelus* was sold in Paris 1889, and brought \$110,000. It was brought to America, and was exhibited to admiring crowds in New York, Chicago, and other places. M. gained second-class medals 1853 and 64, and first-class 1867. He was elected to the Legion of Honor 1868. He died at Barbizon (Seine-et-Marne).

MILLI, prefix, *mĭl-lĭ* [L. *millē*, a thousand]: a thousand-fold.

MILLIARD, n. *mĭl-yâr'* [F. *milliard*—from L. *millē*, a thousand]: a thousand millions.

MILLIGRAMME, n. *mĭl'ĭ-grām* [F.—from L. *millē*, a thousand: Gr. *gramma*, a letter of the alphabet, a figure]: in the metric system, the thousandth part of a Gram (q.v.).

MILLILITRE, n. *mĭl'ĭ-lē'tr* [F.—from L. *millē*, a thousand; F. *litre*, a unit of measure]: the one-thousandth of a Litre (q.v.).

MILLIMETRE, n. *mĭl'ĭ-mā'tr* or *-mèt'r* [F.—from L. *millē*, a thousand; Gr. *metron*, a measure]: a French linear measure containing the thousandth part of a Mètre (q.v.).

MILLINER—MILLS.

MILLINER, n. *mīl'īn-ēr* [supposed to be from *Milan*, a town in Italy—that is, a dealer in Milan wares]: one who makes and sells bonnets, head-dresses, etc., for females. **MIL'LINERY**, n. *-ēr-ī*, bonnets, caps, etc., worn by females; the materials composing them; the business. *Note.*—A *milliner* was formerly of the male sex, and was a dealer in such miscellaneous articles as were imported from Milan. From the fact that formerly a *milliner* was a haberdasher and seller of miscellaneous small-wares, its possible origin from L. *millē*, a thousand, is suggested—see Skeat.

MILLION, n. *mīl'yūn* [F. *million*; Sp. *millon*; It. *milione*, a million—from L. *millē*, a thousand]: ten hundred thousand—in figures, extending to seven places, as 1,000,000; a very great number. **MILLIONTH**, a. *mīl'yūnth*, the ten-hundred-thousandth; constituting one of a million. **MILLIONAIRE**, n. *mīl'yūn-ār'* [F. *millionnaire*]: a man worth a million of money; a very rich man. **MIL'LIONARY**, a. *-ēr-ī*, pertaining to or consisting of millions. **MILLIONED**, a. *mīl'yūnd*, multiplied by millions. **THE MILLION**, the great body of the people; the public, as distinguished from a select class.

MILLRIND, *mīl'rīnd*, or **FER DE MOULIN**, *fär dēh mô-läng'*, in Heraldry: a charge meant to represent a mill-iron, originally a mere variety in designating the cross moline, but accounted a distinct charge by some heralds.



Millrind.

MILLS, CLARK: 1815, Dec. 1—1883, Jan. 12: sculptor: b. in Onondaga co., N. Y. He worked on a farm, learned the trade of millwright, went to New Orleans, and a year later to Charleston, S. C., where he worked as a plasterer until 1835, when he invented a method of taking plaster casts from living bodies. He made a large number of busts in plaster, and in 1846 completed one in marble of John C. Calhoun, which won a gold medal and was placed by the authorities in the city hall of Charleston. Two years later he designed the equestrian statue of Andrew Jackson which stands in Lafayette sq., Washington. In a foundry which he built he learned the art of casting bronze, and he was the first successful worker in this line in the United States. He executed an equestrian statue of Washington, dedicated 1860, Feb. 22, for which the govt. paid \$50,000. He also cast the colossal statue of *Freedom*, designed by Thomas Crawford, which surmounts the dome of the national capitol. He died in Washington, D. C.

MILLS, SAMUEL JOHN, JR.: 1783, Apr. 21—1818, June 16: has been called the 'father of foreign-mission work in Christian America.' He was born Torrington, Conn., graduated from Williams College 1809, and Andover Theol. Seminary 1812. In the latter year he was licensed to preach, but was not ordained until 1815. He was deeply interested in the conversion of the heathen,

and while at Andover he started the movement which resulted in the establishment of the Amer. Board of Commissioners for Foreign Missions; also he was the prime mover in the formation of the Amer. Bible Soc. 1816. He labored 1812-15 for various missionary societies, first in Mass. and Conn., later in the west and southwest. He was then appointed agent for a school near Newark, for the education of colored men as preachers and teachers; and 1817 was sent, with the Rev. Ebenezer Burgess, to Africa by the Amer. Colonization Soc., to select a site for a settlement on the w. coast. He remained in Africa two months, embarked for home 1818, May 22, died of a fever, and was buried in the sea. His *Memoirs*, by Gardiner Spring, D.D., were published 1854.

MILLVILLE, *mīl'vil*: city, Cumberland co., N. J., on the e. bank of the Maurice river, at the head of navigation. It is on the line of the W. Jersey railroad, 41 m. s. and e. of Philadelphia, six m. s. of Vineland. It has nine churches, good schools, two newspapers, a national bank, and several hotels. Its extensive manufactures include cotton, lumber, hollow glassware and window-glass, iron pipes for water and gas, and turbine water-wheels. It has a large trade with the agricultural communities by which it is surrounded, and many of its manufactures are sent to distant points. Pop. (1900) 10,583.

MILMAN, *mīl'man*, HENRY HART, D.D.: English poet and ecclesiastical historian: 1791, Feb. 10—1868, Sep. 24; b. London; youngest son of Sir Francis M., physician to George III. He was educated at Eton, and afterward at Brasenose College, Oxford, where he took the degree M.A., and obtained the Newdegate prize 1812. He published *Fazio: A Tragedy* (successfully brought upon the stage at Covent Garden) 1815; took priest's orders 1817; and soon was appointed vicar of St. Mary's, Reading. In the following year appeared his *Samor, Lord of the Bright City: An Heroic Poem*, followed 1820 by the *Fall of Jerusalem*, a beautiful dramatic poem, with some fine sacred lyrics interspersed. In 1821 M. was chosen prof. of poetry at Oxford, and published three other poems in the same year—*The Martyr of Antioch*, *Belshazzar*, and *Anne Boleyn*. His *Sermons at the Bampton Lecture* appeared 1827, and *History of the Jews* (3 vols.) 1829. The last of these works did not bear the author's name; it was so broadly liberal that ecclesiastics of the stricter sort could hardly fail to be offended. Its weak point was a want of adequate learning, especially in biblical criticism. A new ed., greatly improved, and more critical, yet still far from accurate or solid, with an interesting preface, was published 1863. In 1840 appeared a collected ed. of his *Poetical Works*; also, *History of Christianity from the Birth of Christ to the Abolition of Paganism in the Roman Empire* (3 vols.). In 1849 he was made dean of St. Paul's; and 1854 published his masterpiece, *History of Latin Christianity, including that of the Popes to the Pontificate of Nicholas V.* (3 vols.). It is a work of great learning, liberality,

and chastened eloquence; it shows a broad grasp of human nature in its religious workings, besides a philosophic and poetical sympathy with the different men and opinions which it reviews. The work secured for its author a position in the first rank of English historians. M. edited Gibbon and Horace, and contributed extensively to the *Quarterly Review*. His delightful *Annals of St. Paul's Cathedral* were published 1868, and a complete ed. of his *Historical Works* (15 vols.) 1867-8.

MILMORE, *mīl'mōr*, MARTIN: 1844, Sep. 14—1883, July 21; b. Sligo, Ireland: sculptor. He came to Boston 1851, learned wood-carving from a brother, and graduated 1860 from the Latin School. For some years he was pupil of Thomas Ball. He then opened a studio in Boston, but soon went to Rome to complete his art studies. He produced busts of Sumner, Longfellow, Emerson, and other eminent men. In 1863 he was commissioned to execute a soldiers' and sailors' monument to be placed on Boston Common. The soldiers' monument in Forest Hill Cemetery, Roxbury, is from his design, as are also similar monuments in various cities. Among his noted works are the granite figures of *Ceres*, *Flora*, and *Pomona*, in Horticultural Hall, Boston; the *Weeping Lion* at Waterville, Me.; and the statue of *America* at Fitchburg, Mass. A bust of Webster for the state-house at Concord, N. H., was his last work. He died at Boston Highlands.

MILNE-EDWARDS, *mīln-ēd'wardz*, F. *mēl-nā-dwâr'*, HENRI, M.D.: one of the foremost of recent naturalists: 1800, Oct. 23—1885, July 29; b. Bruges, Belgium. His father was an Englishman. M. studied medicine at Paris, where he took his degree M.D. 1823, but applied himself to nat. history. In 1841 he was appointed prof. of nat. history at the Collège Royal, and afterward to the Faculté des Sciences, of which he became dean, and at the Jardin des Plantes. He was a member of the Académie de Médecine, and of most of the learned academies of Europe and America; and held several orders; among others, since 1861, that of commander of the Legion of Honor. He was among the first zoölogists to make repeated and prolonged visits to the sea-coasts for study of the higher and lower forms alive. He published numerous original memoirs of importance in the *Annales des Sciences Naturelles*, a journal which he assisted in editing for 50 years. His *Eléments de Zoölogie* were issued 1834, and reissued 1851 as *Cours Élémentaire de Zoölogie*. The latter had enormous circulation in his own and other countries, was translated into various languages, and till lately formed the basis of most minor manuals of zoölogy in Europe. His *Histoire Naturelle des Crustacés* (1834-40) was long the standard authority on the crustacea; the *Histoire Naturelle des Corallaires* (1857-60) was almost equally noteworthy. *Lectures on the Physiology and Comparative Anatomy of Man and the Animals* (14 vols. 1857-81) are of great permanent value for the immense mass of details and copious references to scattered sources of information. He had an

important share in a splendid quarto of *Anatomical and Zoölogical Researches on the Coasts of Sicily*. Other works were researches on the nat. history of the French coasts (1832-45) and on the nat. history of the mammalia (1871). In some later works he was assisted by his distinguished son, Alphonse. M.-E. must always hold high rank among the naturalists of the 19th c. His services were valuable especially in the department of the invertebrates. His researches in the distribution of the lower invertebrates led him to the theory of centres of creation; and to this he adhered throughout life, notwithstanding the general acceptance of the newer views of Darwin by scientists.

MILNER, *mīl'nēr*, JOHN, D.D., F.S.A.: 1752, Oct. 14—1826, April 19; b. London: Rom. Cath. controversial writer. He received his education at Edgbaston and Douai, entered the priesthood 1777, two years later had charge of a chapel at Winchester, and 1803 was appointed bp. of Castabala and vicar-apostolic of the Midland district. His *History, Civil and Ecclesiastical, and Survey of the Antiquities of Winchester*, opened a controversy which was long continued, during which he published *Letters to a Prebendary* and the *End of Religious Controversy*, which hold a place as standard works in defense of the Rom. Cath. faith. While holding the office of bishop he took part in political affairs and strongly opposed giving the British government a veto power on the appointment of bishops of the Rom. Cath. Church. He was expelled, 1823, from the bishopric by the English Catholic board, and three years later died at Wolverhampton.

MIL'NER, JOSEPH: ecclesiastical historian: 1744-1797, Nov. 15; b. near Leeds, England. He studied at Cambridge, and afterward became famous as head-master of the grammar school at Hull. He was also lecturer in the principal church of the town, and, 1797, vicar of Holy Trinity Church. M.'s principal work is *History of the Church of Christ*, 4 vols. (3 vols. 1794). His brother, DR. ISAAC M., dean of Carlisle, published a complete ed. of his works, 8 vols., 1810. The principles on which the *History of the Church of Christ* is written are of the narrowest kind; the scholarship, literary style, and critical insight are alike poor.

MILNES, RICHARD MONCKTON: see HOUGHTON, Lord.

MI'LO: Greek island in the Cyclades group: see MELOS.

MILO, *mī'lō*, of Crotona, in Magna Græcia (q.v.): athlete famous throughout the ancient world for his great strength: lived, according to Herodotus, about the end of B.C. 6th c. Among other displays of strength, he is said to have carried a live ox upon his shoulders through the stadium of Olympia, and afterward to have eaten the whole of it in one day; and on another (reversing the story of the Hebrew Samson), to have upheld the pillars of a house in which Pythagoras and his scholars were assembled, so as to give them time to make their escape

when the house was falling. He is said to have lost his life through too great confidence in his own strength, when he was growing old, in attempting to rend asunder a tree, which some wood-choppers had left partially split, with a wedge: the wedge dropped out, and the tree closed upon his hands, holding him fast until he was devoured by wolves. This tradition has been used to point a moral.

MILREI, n., or MILREA, n., or MILREE, n. *mīl'rē* [Port. *mīl reis*, one thousand reis]: a Portuguese silver coin and money of account, value 4s. 8½*d.* to 4s. 10*d.* (abt. \$1.14½ to \$1.17½); used also in Brazil, where value, however, is from 2s. to 2s. 3*d.* only (abt. 48⅔ cents to 54⅔ cents). The coin is commonly known in Portugal as the *coroa*, or 'crown,' and is (since 1835, Apr. 24) the unit of the money-system in that country. The half-*coroa*, or half-milrei, of 500 reis, also is used in both Portugal and Brazil. The name 'milrei' was used in Portuguese accounts long before any coin representing its value existed.

MILT, n. *mīlt* [Icel. *milti*; Dan. *milt*; It. *milza*, the spleen: Pol. *mleko*, milk; *melez*, milt of fish: connected with Eng. *milk*]: the soft whitish substance found in male fish, as the roe is found in female fish; the spleen: V. to impregnate eggs or spawn, as a fish. MILT'ING, imp. MILT'ED, pp. MILT'ER, n. -*ér*, a male fish.

MILTIADES, *mīl-tī'a-dēz*: celebrated Athenian general: B.C. 5th c.: 'tyrant of the Chersonese,' yet, as Byron sings, 'freedom's best and bravest friend.' Forced by Darius to flee from his dominions, he took refuge at Athens, and on the second Persian invasion of Greece, his military talents being of a high order, he was chosen one of the ten generals. He distinguished himself particularly by the great victory which he gained at Marathon (q.v.), with a small body of Athenians and 1,000 Plataeans (B.C. 490, Sep. 29), over the Persian host, under Datis and Artaphernes. By this victory, the Greeks were emboldened for the heroic struggle which they made in defense of their country and their liberty. M., being intrusted with the command of an armament for the purpose of retaliating on the Persians, made an attack on the island of Paros, to gratify a private enmity; but failing in the attempt, he was, on his return to Athens, condemned to pay a heavy fine as indemnification for the expenses of the expedition. Being unable to do this, he was thrown into prison, where he died of a wound received at Paros. The fine was exacted after his death, from his son, Cimon (q.v.).

MILTON, *mīl'ton*: town, Norfolk co., Mass., on the Neponset river, 9 m. s. of Boston, with which it has both steam and street railroad connections. It has extensive market-gardens, and manufactories of rubber goods, leather, paper, and chocolate. Quarries of a very fine granite are worked in summer. There are many beautiful drives, and the roads are excellent. Within the limits of M. are the Blue Hills, from which the state of Mass. received its Indian name. Pop. (1900) 6,578.

MILTON.

MILTON, JOHN: English poet: 1608, Dec. 9—1674, Nov. 8; b. in Bread Street, Cheapside, London; of an ancient Rom. Cath. family, though his father, becoming a Protestant, had been disinherited. 'M.'s father followed the occupation of a scrivener, by which lawyerly business, according to Aubrey, 'he got a plentiful estate,' and was a man of great musical accomplishment, being composer, among other things, of the two well-known psalm-tunes *Norwich* and *York*. From him his son derived his matchless ear for melody, and that strict integrity of character for which he is as famous as for his verse.

M. was carefully nurtured and educated. He was placed first under the care of a private tutor named Young, a Scotchman by birth and education; and at the age of 12 was sent to St. Paul's School, London, and afterward to Christ's College, Cambridge. According to the University Register, he was admitted 1624-5, Feb. 12. At first he was unpopular in the university, and was nicknamed 'the Lady of Christ's College,' partly from the gracefulness of his person, and partly from his fastidious severity of morals—a sort of haughty Puritanism. Before his graduation, however, he won general deference and regard, and a very high repute for scholarship and genius. He took his degree M.A.; and having relinquished the idea of following divinity because he could not bring himself to subscribe to Laud's high prelacy then in vogue, he left Cambridge 1632, and went to live at his father's house at Horton, in Buckinghamshire. There, in serenity of mind, he lived five years, reading the Greek and Latin poets, and composing *Comus*, *Lycidas*, *Arcades*, *L'Allegro*, and *Il Penseroso*. On the death of his mother, 1637, he went abroad, visiting the chief Italian cities, and making the acquaintance of Grotius and Galileo. While travelling, being made aware that clouds were gathering in the political atmosphere at home, he returned in 1639, and engaged himself with the tuition of his nephews—on which portion of M.'s life, Dr. Johnson could not avoid looking with 'some degree of merriment.' In 1641, he engaged in the controversies of the times, and in the course of that and the following year, he issued the treatises *Of Reformation*, the most powerful polemic pamphlet of the time against the prelatical episcopacy which had been retained when the English church had been reformed; *The Reason of Church Government urged against Prelacy*; *Prelatical Episcopacy*; and *An Apology for Smectymnus*. In 1643, he married rather suddenly Mary, daughter of Richard Powell, an Oxfordshire royalist, but the union did not at first prove happy. His wife, only 17 years of age, who had been accustomed to 'dance with the king's officers at home,' found her husband's society too austere and philosophic for her gay tastes. After the severe honeymoon was over, she obtained permission to visit her relatives till Michaelmas; but when Michaelmas came, she refused to return, and from her royalist family came the intimation that he need never expect her return. Stern and proud,

M. repudiated her at once; and the matrimonial disagreement made the world the richer by four *Treatises on Divorce*. A reconciliation, however, took place, which, we have no reason to doubt, was both genuine and permanent. Mary Powell died 1652-3, leaving her husband three daughters, Ann, Mary, and Deborah, of whose undutifulness and ingratitude we have latterly many complaints. In 1644 he produced his *Tractate on Education*; and, as a sort of remonstrance to the Long Parliament against their restriction of the liberty of printing, his famous *Areopagitica*—a flame of eloquence which still gives heat. The pressure of events had led Cromwell to fear the intolerance of the majority in the Long Parliament, who were bent on establishing the Church of England as Presbyterian and suppressing the various kinds of Independents or Congregationalists as sectaries and schismatics. Cromwell, as a believer in congregational independency, did not oppose a Presbyterian establishment, but insisted that such establishment should not be without guaranties of liberty of conscience and universal toleration, at least to all Protestants. The army, now victorious under Cromwell, was full of independent sectaries who echoed this demand for liberty. Milton's whole nature was in sympathy with it, and he plunged eagerly into the contest in its behalf. His theology, though deeply evangelical, was far from strictly Calvinistic, and he was in advance of his times in his cordial trust in the safety of liberty whether in church or state. In his tolerant views of church-order, he agreed with Cromwell, whom he greatly revered, calling him, 'Our Chief of Men.' After the execution of King Charles, he was appointed Latin sec. to the council of state, with a salary of £290, equal now to about \$5,000. In his new position, his pen was as terrible as Cromwell's sword. In *Eikonoklastes*, he made a savage but effective reply to the famous *Eikon Basilike*; and in his *Pro Populo Anglicano Defensio* he assailed his opponent, Claude de Saumaire, better known as *Salmasius*, and reputed the greatest scholar in Europe, with such a storm of eloquence and abuse, that the latter, who died at Spa 1653, is believed to have lost his life through chagrin. M. at least flattered himself with having 'killed his man.' His second wife, whom he married 1656, Nov. 12, was daughter of Capt. Woodcock of Hackney. She died in childbed 1658, Feb., and her husband has enshrined her memory in an exquisitely pure and tender sonnet.

Unceasing study had affected his eyesight, and about 1654, M. became totally blind. After the Restoration, he retired from affairs; he was obnoxious to the reigning power, and it is said that he was once in custody of the sergeant-at-arms. On the publication of the Act of Oblivion, he married his third wife, Elizabeth Minshull, and shortly afterward removed to a house in Artillery Walk, when he was busy with *Paradise Lost*. This great poem was planned originally as a mystery, then some idea of treating it as a drama haunted the author's mind; finally,

however, he resolved to write an epic poem on the Fall of Man. The poem was published 1667. He received five pounds from his publisher, and a promise of other five pounds when 1,300 copies should have been sold. In 1670, he published his *History of England*. Next year, he printed *Paradise Regained* and *Samson Agonistes*. He died, leaving property to the value of £1,500, and was buried next his father, in the chancel of St. Giles, Cripplegate.

M. was, above all English poets, stately and grand. He arrived early at the knowledge of his powers, and did not scruple, in one of his prose tracts, to inform his readers that he purposed to write a poem which would be considered one of the glories of his country. Drawn away for a time by the heats of controversy and by official tasks, he never forgot his pledge, and redeemed it at last in old age, blindness, and neglect. In comparison, other poets are like sailing-ships, at the mercy of the winds of passion and circumstance; he resembled the ocean-steamer, which, by dint of internal energy, can pierce through the hurricane. Never, perhaps, was a mind more richly furnished. His careless 'largess' is greater than the fortunes of other men. His *Comus* is the very morning-light of poetry; while in his great epic, *Paradise Lost*, there is a massiveness of thought, a sublimity of imagery, a pomp of sound—as of rolling organs and the outbursting of cathedral choirs—which can be found nowhere else. His great passages echo in the mind as if loath to die. Of all great writers, he is perhaps the one for whom we are conscious of the least personal affection, and this arises from a certain hauteur and severity which awes—which repels some natures; yet he infects his reader with his own seriousness. See Pattison's short life (1879); Stern's *M. u. seine Zeit* (1878); and Masson's *Life and Times of M.*, 6 vols. (1858–80).

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MILWAUKEE, *mīl-waw'kē*: city, port of entry, county seat of Milwaukee co., Wis.; on Lake Michigan, the Milwaukee river, and the Chicago and Northwestern, the Chicago Milwaukee and St. Paul, and the Wisconsin Central railways; 82 m. e. of Madison, 85 m. n. of Chicago: area 21 sq. m.

River and Harbor.—The water front is on a curve of the shore inward, which gives the city an excellent bay, 6 m. wide from cape to cape, and 3 m. inward from an imaginary line between the headlands. The Milwaukee river flows through the city, receiving the waters of the Keimickinnic near its mouth, and of the Menomonee a little farther up. Both of these branches have been improved by costly operations; and the main stream, by means of a dam at the head of deep water, has been given a depth which permits large vessels to move to the docks near the centre of the city. The U. S. govt. has constructed a breakwater in the bay at a cost of over \$1,000,000, and provided a spacious harbor of refuge for lake shipping.

Plan of the City.—Immediately n. of the harbor the shore rises 80–100 ft. above the lake and makes a beautiful residential section, and on the w. side the elevation is 125–175 ft., the crown being beautified by costly dwellings and furnishing an admirable outlook. For a goodly stretch along the lake the bluff has been transformed into a public park, with terraces down to the beach. The three river water-courses and the canal are crossed by 2 lift, 8 stationary, and 21 swinging bridges, nearly all of iron. Rapid transit was promoted 1895 by the Milwaukee Street Railway Co., which owned the entire street railway system of the city and extensive electric light and power plants; was reorganized (Aug.) after being placed under a receivership; and operated over 145 m. of trolley road.

Local Improvements.—The present water-works system was completed 1874 at a cost of \$2,149,000, and supplies the city from the lake. An intake tunnel beneath the lake for the new water-supply was completed 1895, July. This work is a marked triumph of engineering skill, and in its progress apparently insurmountable difficulties were overcome, 19 lives were lost, and the city expended \$575,000. The intake can furnish 90,000,000 gal. of water per diem, from a distance of 60 ft. below the surface of the lake, and of a uniform temperature in summer and winter. Another conspicuous improvement was the completion of the new City Hall, in which the city council held its first session 1895, Dec. 23. The building cost \$1,000,000. In 1895 the water-works system had 276 m. of distributing pipe, 2,065 fire hydrants, 122 fire cisterns, aggregate receipts from all sources \$460,000, and outstanding bonded debt of \$1,643,000. The city owns the system, and receives from it annually more than the aggregate of interest charges on the municipal debt. The fire department had 19 steam-engines, 2 fire boats, 8 hook and ladder trucks, 314 officers and men, and property valued at over \$860,000. Works have been provided by which the Milwaukee river is regularly flushed with clear water from

the lake; and the sewerage system had over 270 m. of trunk and laterals, which had cost \$3,436,275, exclusive of the Menomonee special sewer.

Public Parks.—The park system is a recent development, and 1895 comprised 7 tracts, ranging in size from 24 to 125 acres. The two largest are the Lake Park, on the e. side, extending along the lake shore for nearly 2 m. and including 124 acres, and the West Side Park, on the n.w. border of the city, having 124½ acres. The others are River Park, e. side, 24 acres; Mitchell, 31 acres; Howell Avenue, 45 acres; Coleman, s. side, 26 acres; and Perigo, w. side, 24 acres. Under acts of the legislature 1889 and 1891, the park commissioners expended over \$1,000,000 in the purchase of these tracts, and are allowed annually for improvements a small percentage on all taxable property, amounting 1895 to about \$70,000.

Public Buildings.—Besides the new City Hall there were 1895 either completed or in course of erection a U. S. govt. building (cost \$1,500,000); Industrial Exhibition building (over \$300,000); library and museum (\$500,000); the Union and the Chicago and Northwestern railway stations; the Athenæum building, belonging to the Women's Club; State Fish Hatchery; State Normal School; Layton Art Gallery; Board of Trade building; Convent and Mother-house in the U. S. of the Sisters of Notre Dame; U. S. Life-saving Station; 2 light-houses; U. S. Marine Hospital; National Soldiers' Home; State Industrial Home for Girls; State Training-school for Nurses; County Hospital for the Chronic Insane; Wisconsin General Hospital; and the Johnston Emergency Hospital, built by the city 1894, cost \$50,000.

Churches and Charities.—Milwaukee is the seat of a Rom. Cath. archbishopric and of a Prot. Episc. bishopric. In 1895 it had 147 church and mission buildings, divided denominationally as follows: Luth., 34; Rom. Cath., 27; Meth. Episc., 18; Congl., 10; Bapt., 10; Prot. Episc., 10; Presb., 9; Evan. Assoc., 6; Evan., 5; Jew., 4; Ref., 2; Scientist, 2; Advent., 1; Christian, 1; Unit., 1; miscellaneous, 7. The charitable institutions, besides those mentioned, included the Prot. Home for the Aged; Milwaukee Rescue Mission; City Orphan Asylum; City Orphans' Home; City House of Mercy; Home for the Friendless; Home for the Aged; Girls' Home; Deaconesses' Home; Boys' Home Industrial School; the Brown Hospital; Milwaukee Children's Hospital; Milwaukee Hospital; St. Francis Hospital; Sacred Heart Sanitarium; St. Mary's Hospital; and convents of St. Francis and St. Joseph.

Education.—In 1895 there were 49 public schools, including a day school for the oral teaching of deaf-mutes and 3 high schools, and 54 parochial schools. The institutions for higher education, besides the State Normal School, included Milwaukee-Downer College for Women, Milwaukee Medical College and School of Dentistry, Wisconsin College of Physicians and Surgeons, Concordia College (Luth.), Marquette College (Rom. Cath.), Theol. Sem. of the Synod of Wis. (Luth.), Cathedral Institute (Prot.

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Episc.), and the National German-American Teachers' Seminary. There were 19 libraries of all kinds, with an aggregate of about 125,000 volumes, and 73 newspapers and periodicals, of which 10 were daily, 6 semi-weekly, 33 weekly, 7 semi-monthly, 16 monthly, and one quarterly. The city is widely noted for its attractive club life. Of more than 80 such organizations, fully two-thirds were musical and singing societies.

Finances and Banking.—In 1902 the city had an assessed valuation of \$171,881,364, of which \$137,404,081 was on real estate and \$34,477,283 on personal property. The tax rate was \$23.37 per \$1,000. Total tax levy for the year was \$3,334,935.99. Property was assessed at about one-half market value. Total bonded debt 1903, Jan. 1, was \$7,152,750 (including a water debt of \$578,750), sinking funds held \$418,800, making the net debt \$6,733,950. Most of the bonds are subject to an annual call of about 5 per cent. of the original issue. In 1895 there were 5 national banks (cap. \$3,250,000), 4 incorporated banks (cap. \$1,234,600), a savings-bank (cap. \$200,000, surplus \$300,000), and a clearing-house association. The national banks, according to reports on Oct. 31, held \$720,000 in U. S. bonds, an excess of \$470,000 beyond the amount required; had \$15,493,873 outstanding on loans and discounts; held \$2,289,312 in coin and coin certificates, of which \$2,137,695 was in gold coin; had deposits aggregating \$19,031,575; and reported a reserve on hand of \$5,789,986, an excess of \$1,032,092 beyond the legal requirement, and, for the period 1894, Sep. 1—1895, Mar. 1, surplus \$358,000, net earnings \$206,104, and dividends \$239,000. These banks had total resources \$24,996,897. During the year ending 1895, Sep. 30, the exchanges at the U. S. clearing-house in M. aggregated \$239,549,926, an increase of \$15,291,330 over the total of the previous corresponding year. The U. S. govt. report on building and loan associations showed 14 such organizations in the city, all but one of which were local, 7 were serial, 4 permanent, and 3 terminating. Together there were 7,210 shareholders, 1,737 borrowers, and 31,247 shares in force.

Commercial Interests.—During the calendar year 1895, the imports of foreign merchandise aggregated in value \$917,554. The foreign trade is insignificant in comparison with the domestic; and the reports of 1892-95 concerning the latter are not a just showing of the trade interests of the city because of the general business depression and its results. In the 5 years preceding 1894, the annual receipts of all kinds of grain rose from 18,709,721 bu. 1889 to 36,683,849 bu. 1892, 35,584,394 bu. 1893, and 31,228,920 bu. 1894, when there was a marked deficiency in the wheat crop in the region that usually supplies the city. The receipts of barley 1894 showed an increase of nearly 800,000 bu., and were largely in excess of any other kind of grain. Including malt and flour reduced to bu., the total receipts were equivalent to 42,071,550 bu. of grain, and the total shipments to 31,857,975 bu., against 45,062,801 and 33,590,686 bu., respectively, 1893. The output of the flour mills 1894

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was 1,576,064 bbl., against 1,850,823 bbl. 1893, and 2,117,-009 bbl. 1892; the receipts of flour, mostly for transshipment to lake steamers 1894, were 2,209,403 bbl.; and the total shipments, 3,163,271 bbl. Of 13,000,000 bu. of barley received 1894, one-half was taken by local malsters; and of 4,964,224 lbs. of wool received, one-third went into local factories. The meat-packing industry showed a revival 1894, when the receipts were 660,134 hogs, 68,522 sheep, 52,-593 beef cattle; and the tanning and leather business advanced in volume 25-30 per cent. 1894-5, when 835,518 beef hides were received and tanned and over 500,000 calf skins were converted into leather. Coal receipts 1894 aggregated 1,340,117 tons, which was 34,297 tons less than the highest annual receipt, 1,374,414 tons, 1892. The value of the manufacturing output of 1894 was estimated by the Chamber of Commerce at \$180,000,000.

Manufactures.—The following table shows the increase in the manufacturing industries by the census reports of 1880 and 1890, and the principal industries, in the order of value of output, reported 1890:

Principal industries.	Es-tab.	Capital.	H'nds em-pl'y'd	Wages paid.	Cost of materials	Value of output.
		\$		\$	\$	\$
All industries, 1890.....	2,879	69,145,814	43,423	20,646,717	55,815,485	97,503,951
All industries, 1880.....	844	18,766,914	20,886	6,946,105	28,975,872	43,473,812
Increase.....	2,035	50,378,900	22,537	13,700,612	26,839,613	54,030,139
Malt liquors.....	9	13,034,727	2,188	1,299,512	3,567,849	10,810,695
Tanned and curried leather....	14	4,919,919	1,767	1,001,915	6,712,113	8,429,814
Meat-packing...	4	2,053,530	680	351,614	7,261,616	7,890,117
Machine-shop products.....	44	5,518,172	3,263	1,736,352	2,554,475	5,586,445
Flour and grist-mill products..	10	1,751,737	370	241,171	3,936,077	4,438,983
Carpentry.....	206	1,091,552	1,899	1,159,727	2,005,717	3,581,904
Men's clothing..	20	2,868,528	2,488	632,237	2,099,612	3,541,369
Planing-mill products.....	17	1,488,081	1,393	652,933	1,434,246	2,360,659
Masonry, brick and stone.....	73	627,790	1,486	801,761	1,168,406	2,216,357
Malt.....	10	2,119,413	284	202,750	1,649,903	2,174,830
Slaughtering (without packing).....	5	238,441	105	63,944	1,374,055	1,814,849
Boots and shoes.	17	1,792,315	1,140	483,472	820,170	1,617,534
Women's clothing.....	405	157,202	1,051	317,704	991,474	1,591,642
Bread and bakery products..	174	655,698	744	308,088	955,994	1,576,127
Printing and publishing.....	34	879,489	852	505,003	346,142	1,436,184
Furniture, factory product..	16	897,936	893	430,498	625,054	1,313,489
Cigars and cigarettes.....	169	584,449	950	412,958	480,747	1,258,938
Chewing, smoking, and snuff tobacco.....	4	683,774	264	125,969	353,896	1,212,668
Hosiery and knit goods.....	14	874,323	1,716	294,662	617,520	1,114,025

According to the U. S. census of 1900 there were 3,342 manufacturing establishments, employing \$110,-363,854 capital, and 48,328 persons, paying \$20,240,656 for wages and \$65,118,719 for materials; and yielding products valued at \$123,786,449. The principle articles were, foundry and machine shop products, \$14,495,362; malt liquors, \$13,899,390; leather, \$10,267,835; iron and steel, \$7,410,213; flouring and grist mill products, \$6,357,983; slaughtering and meat packing, \$5,980,340; clothing, men's and women's, \$5,483,666; carpentering, \$3,324,734; boots and shoes, \$2,397,350; malt, \$2,317,-870; agricultural implements, \$2,296,888; bread and other bakery products, \$2,157,802; and enameling and enamelled goods, \$1,708,171.

Shipping.—There were registered at the custom-house 1894, Dec. 31, 41 propellers of 30,690 tons; 58 schooners of 10,159; 18 tugs of 373; and 4 sloops and scows of 264—total vessels, 121, tonnage 41,486. During the year the arrivals were 5,177 vessels of 3,451,366 tons, and departures, 5,093 vessels of 3,487,674 tons. Ship-building was the most important of the early industries of the city, and for many years a large proportion of the sailing vessels of the lakes was built here. At one time there were about a dozen ship-yards, but these are now reduced to two very large ones belonging to a single corporation.

History.—The first white settler on the site of the city was Solomon Juneau, who built a cabin 1818. Up to the time of the Black Hawk war his only near neighbors were bands of Indians, who made this section their headquarters for many years. The place was permanently settled 1835, a large part of the people coming from the state of New York. In 1845 the population numbered about 9,000, and was growing rapidly. Two years before this date an agitation had been begun for the establishment of a city government, which resulted in the adoption of a city charter by a vote of the people in Dec., 1845. On Jan. 24, 1846, this charter was enacted into a law by the action of the territorial legislature. Solomon Juneau was the first mayor elected under this charter. The 50th anniversary of the birth of the city was celebrated Oct. 16-17, 1895, an earlier than the true date being chosen to relieve the out-door demonstrations of the severities of mid-winter.

M., according to the census of 1890, had 54,776 natives of Germany among its population, and the total number of natives of German-speaking countries was 56,309. The natives of Germany constituted nearly 27½ per cent. of the population. Thousands of the native-born population are of German parentage, and it is figured that over one-half of the population of the city were either of direct German descent or nativity. The state census of 1895 showed a population of German nativity of 59,442.

Noted Fires.—In the early morning of Jan. 10, 1883, a fire broke out in the basement of the Newhall House, and, communicating with the elevator shaft, in an incredibly short time had cut off all means of exit from the upper floors. Scores of the imprisoned guests and employes threw themselves from the windows, only to be crushed to

death upon the pavement or railings below. It required weeks to fully explore the ruins and recover the remains of the victims. Nearly 100 lives were lost in this fire.

The most serious loss of property by fire in the history of the city occurred Oct. 28, 1892. By this fire there were nearly 300 buildings destroyed. All but two of the wholesale grocery houses of the city, many other commercial and manufacturing concerns, a part of the gas-works, several hundred freight cars, and a large number of dwellings were burned. Over 2,000 people were rendered homeless by this fire. The loss was nearly \$4,000,000.

Miscellaneous.—Appointments in the police and fire departments of M. are made from applicants who have passed a rigid examination by a civil service commission. Under this reform, established within a few years, the efficiency of both departments has been materially increased. The fire loss as shown by the last annual report was \$364,854.22. Property is owned by the municipality to the value of over \$20,000,000. There are 220 miles of improved streets, 67 of which are paved. \$5,500,000 has been expended for street improvements. The cost of the sewerage system aggregates \$3,500,000. In no city of the United States is the percentage of residents who live in their own homes larger than in Milwaukee. In 1845 the only regular means of communication between M. and Chicago was by a daily stage line. The fare each way was \$10.00, and the time required to make the run varied from ten to twenty-four hours. There are now 32 daily passenger trains between the two cities, and the shortest time required to make the run is 1 hour 55 minutes. Besides the railroad communication there are three lines of steamers of the largest and fleetest class between the two cities. By these lines the fare varies from 50 cents to \$2.00 for the round trip. During the year 1895 these three lines carried 365,000 passengers. By reason of its location upon the lake shore, M. is a delightful summer resort and is in direct communication, by rail and electric lines, with numerous noted summer resorts of the lake region in s. Wisconsin.

Population.—(1840) 1,712; (1850) 20,061; (1860) 45,246; (1870) 71,440; (1880) 115,578; (1890) 204,468; (1895) state census, 249,290; (1900) 285,315.

MÎMĀNSĀ [from the Sanskrit *mân*, to investigate; hence, literally, investigation]: collective name of two of the six divisions of orthodox Hindu philosophy: see SANSKRIT LITERATURE. It is distinguished as *Pârva-* and *Uttara-mîmânsâ*, the latter being more commonly called *Vedânta* (q.v.), while the former is briefly styled *Mîmânsâ*. Though the M. is ranked, by all native writers, with the five other philosophical systems, the term philosophy—as understood in a European sense—can scarcely be applied to it; for the M. is concerned neither with the nature of the absolute or of the human mind, nor with the various categories of existence in general—topics dealt with more or less by the other five philosophies; its object is merely to lay down

a correct interpretation of such Vedic passages as refer to the Brâhman'ic ritual, to solve doubts wherever they may exist on matters concerning sacrificial acts, and to reconcile discrepancies—according to the M., always apparent only—of Vedic texts. The foundation of this system is therefore preceded by a codification of the three principal Vedas—the R'ik, Black-Yajus, and Sâmā—and has in view the existence of schools and theories which, by their different interpretations of the Vedic rites, had begun to endanger, or, in reality, had endangered a correct, or at least authoritative understanding of the Vedic texts. It is the method, however, adopted by the M. which imparted to it a higher character than that of a mere commentary, and allowed it to take rank as a philosophy; for, in the first place, the topics explained by this system do not follow the order in which they occur in the Vedic writings, especially in the Brâhma'na portion of the Vedas (q.v.); they are arranged according to certain categories, such as authoritativeness, indirect precept, concurrent efficacy, co-ordinate effect, etc; and secondly, each topic or case is discussed according to a regular scheme, which comprises the proposition of the subject-matter, the doubt or question arising upon it, the *primâ-facie* or wrong argument applied to it, the correct argument in refutation of the wrong, and the conclusion devolving from it. Some subjects treated of in the M., incidentally as it were, and merely for sake of argument, belong more to the sphere of philosophic thought than to that of commentatorial criticism; e.g., the association of articulate sound with sense, the similarity of words in different languages, the inspiration or eternity of the Veda, the invisible or spiritual operation of pious acts, etc. The reputed founder of this system is Jaimini—of unknown date—who taught it in 12 books, each subdivided into four chapters, except the 3d, 6th, and 10th books, which contain eight chapters each; the chapters are divided into sections, generally comprising several Sûtras or aphorisms, but sometimes only one. The extant commentary on this obscure work is the *Bhâshya* of 'Sabara-swâmin, which was critically annotated by the great M. authority, Kumârila-swâmin. Out of these works, which, in their turn, quote several others, apparently lost, have arisen many other writings, explaining and elucidating their predecessors. The best compendium, among these modern works, is the *Jaiminîya-nyâya-mâlâ-vistara*, by the celebrated Mâdhavâchârya (q.v.).

MIME, n. *mîm* [L. *mimus*; Gr. *mimos*, a farcical entertainment, the actor in it, a mime: Gr. *mimo*, an ape: comp. Basque, *mama*, to mask one's self in a hideous manner]: *formerly*, a kind of farce; a dramatic performance among the ancient Greeks and Romans; an actor in such (see MIMES). MIMETIC, a. *mî-mêt'ik*, or MIMET'ICAL, a. *-î-kâl*, apt to imitate; imitative. MIMIC, a. *mîm'ik*, or MIM'ICAL, a. *-î-kâl*, inclined to imitate the manners and peculiarities of another. MIM'ICALLY, ad.

MIMES—MIMICRY.

-*lī*. MIMIC, n. one who imitates the voice, gestures, and manners of another, in order to excite laughter; an actor: V. to speak or act like another in order to excite laughter or ridicule; in *zool.*, to assume, as certain animals do, the dress of other species or a close resemblance to natural objects; there is no evidence that such action is voluntary. MIMICKING, imp. *mīm'ik-ing*. MIMICKED, pp. *mīm'ikt*. MIMICRY, n. *mīm'ik-rī*, the imitation of the voice, gestures, and manners of another, for sport or ridicule.—SYN. of 'mimic, v.': to counterfeit; mock; aim; imitate.

MIMES, *mīmz*: certain dramatic performances among the ancients, in which, with little attempt at art, scenes of actual life were represented, sometimes in improvised dialogue. The Greek M. appear to have been invented by the Greeks of Sicily and s. Italy. They were a favorite amusement of convivial parties, the guests themselves being generally the performers. Sophron of Syracuse, about B.C. 420, composed many in the Doric dialect, which were much admired, and which Plato was accustomed to read.—The Roman M. were not borrowed from the Greek, but were of native Italic growth. They were not only far ruder and coarser, but in some respects they were essentially different—the dialogue occupying a smaller place, and mere gesture and mimicry predominating. The humor and satire, however, were often genuine, though rough, and even indecent, and they were greatly relished by all classes; even the patrician Sulla was fond of them.

MIMETITE, n. *mīm'ē-tīt*, or MIMETESITE, n. *mī-mēt'-ē-sīt* [Gr. *mimētēs*, an imitator]: a mineral, arseniate of lead, occurring in regular six-sided prisms, of a yellowish-brown color—so called from its resemblance to pyromorphite.

MIMIC, MIMICRY: see under MIMÉ.

MIM'ICRY, in Biology: form of resemblance, wholly external and visible, and not due to kinship, by which a more defenseless and less numerous species, e.g., of butterflies, gain protection through their enemies mistaking them for another species, which some offensive odor or taste secures against attack. The studies of W. H. Bates, in *The Naturalists on the River Amazon*, 1863, first brought out, and adequately explained, the varied and surprising facts of M., which, so far as noted by earlier observers, had been considered one of the inexplicable curiosities of nature. In the Amazon valley, the richest butterfly region in the world, Mr. Bates found many species of butterflies, which are eatable by insect-devourers, but are, to a large extent, not attacked, because they closely resemble other more abundant species, which are protected by their offensive odor or taste. The acquisition of this protective resemblance has preserved the species, when otherwise their enemies would have destroyed them. The principle prevails very widely throughout nature. Wherever an extensive group is

MIMOGRAPHER—MIMOSA.

protected, either by distastefulness or by offensive weapons, there are usually some species of eatable and inoffensive groups that gain protection by imitating them. The distasteful or offensive beetles, butterflies, wasps, bees, or ants thus afford protection to their imitators; poisonous snakes to non-poisonous, which mimic them; and, among birds even, the sparrow-hawk is related to the weak and defenseless cuckoo through M., and the powerful and noisy 'Friar-birds,' of the Malay Archipelago, protect the orioles, through the latter having gained resemblance to the former. Wallace in his *Darwinism*, 1889, explains the place of M. in nature. It is a curious fact that, while among land animals the number of known cases of M. is very large, among aquatic creatures it is very small.

MIMOGRAPHER, n. *mīm-ōg'ră-fēr* [Gr. *mimos*, a mimic; *graphō*, I write]: a writer or actor of farces.

MIMOSA, n. *mī-mō'ză* [Gr. *mimos*, an imitator]: genus of leguminous plants including many species, one of which is the sensitive plant, so called from the leaves being more or less sensitive to the touch, sub-ord. *Mimōsēæ*, ord. *Legumīnōsæ*. **MIMOSEÆ**, sub-order of *Leguminosæ*, one of the largest nat. orders of exogenous plants; distinguished by regular flowers and petals valvate in bud: 28 genera and about 1,100 species are known, all natives of warm climates, a few only extending beyond sub-tropical regions in the s. hemisphere. The genera *Acacia* (q.v.) and *Mimosa* are best known. To the latter genus belong the Sensitive Plants (q.v.). Some of the larger species of M. are valuable timber trees. The **TALHA**



Mimosa Nilotica.

(*Mimosa ferruginea*) is one of the most common trees of central Africa. They are trees also of great beauty. Some species of the genus *Prosopis*, natives of the w. parts of South America, are remarkable for abundance of tannin in their pods.

MIMULUS—MINA BIRD.

MIMULUS, n. *mīm'ū-lūs* [dim. of L. *mimus*, a mimic actor—so named from the resemblance of the corolla to a mask]: genus of herbaceous plants of nat. order *Scrophulariaceæ*, having a prismatic 5-toothed calyx, a somewhat bell-shaped corolla, of which the upper lip is bifid and the lower lip trifid, the lobes not very unequal, two long and two short stamens, and a stigma of two lamellæ, which close together upon irritation. The species are mostly natives of America. Some are very frequent in flower-gardens, and many fine varieties have resulted from cultivation. They sometimes receive the name *Monkey-flower*. One species, *M. luteus*, native of Peru and Chili, has become naturalized in many parts of Britain. The little yellow-flowered MUSK PLANT, now so common in gardens and on window-sills in Britain, is *M. moschatus*, a native of Oregon and other north-western parts of America.

MINA, n. *mī'nă* [Gr. *mna*; L. *mina*—from an oriental word *maneh*, signifying weight]: among the *ancient Greeks, Romans, or Jews*, a weight; a coin. The Greek M. or Mna contained 100 Drachmæ (see DRACHM), and was the 60th of a talent; consequently, as a *weight*, it was equivalent to about $1\frac{1}{3}$ lb. avoirdupois, varying in different districts to the extent of one-third of a lb. more or less, following the fluctuations of the talent itself. As a *money of account*, it preserved the same relation to the talent, and was probably (on a general estimate) worth between \$19 and \$20.—M. or *Maneh* was also a Hebrew weight and money denomination; it was $\frac{1}{60}$ (or $\frac{1}{50}$) of a talent, and contained 50 shekels: its modern equivalent is roughly estimated at 2 lb. 6 oz. in weight, and somewhat more than \$25 in money. But different localities had different standards and usages, and there were many fluctuations. See DRACHM: SHEKEL: TALENT.

MINA BIRD (*Eulabes Indicus* or *Gracula Indica*): species of Grakle (q.v.), or of a nearly allied genus, native of many parts of the E. Indies, about the size of a common thrush, of deep velvety black color, with a white mark on the base of the quill-feathers of the wings, yellow bill and feet, and two large bright yellow wattles at the back of the head. The bill is large, conical; the upper mandible a little curved and sharp-pointed. The food of the M. B. consists of fruits and insects. It is very lively and intelligent, and possesses a power of imitating human speech excelled by none of the parrots. It has sometimes been trained to repeat sentences of considerable length. It is therefore in great request, and is often brought to Europe.—Another and larger species is found in Sumatra and some of the other eastern islands, possessing the same power of articulation. It is highly prized by the Javanese.

MINAMOTO—MINAS GERAES.

MINAMOTO, or GEN: ancient noble family in Japan, for many centuries milit. vassals of the mikados. The M. family was founded by two grandsons of the 57th mikado, Seiwa (reigned 859-76). The two M. branches, descended from these princes, have supplied hundreds of milit. leaders to the service of the mikados. Yoritomo, the earliest shogun, or gov.-generalissimo, about the end of the 12th century, who became the real ruler, while the mikado's power was but nominal, was of the M. family. It was under the leadership of M. generals that the whole of e. and n. Japan, above 36° lat. n., was conquered, the aboriginal tribes made subject to the court at Kioto, and the mikado's sway extended even into Yezo. 17 noble families of the mikado's court are of M. descent; among them, Iwakura, Ohara, Higashi, Kuze, and others prominent in the govt. of Japan. The M. crest is three bamboo leaves surmounted by gentian flowers.

MINARET, n. *mīn'ă-rĕt* [Sp. *minarete*, a high slender turret—from Ar. *mamârat*, a lamp, a lantern]: the lofty turret frequent in Saracenic architecture. It contains a staircase, and is divided into several stories, with balconies from which the priests summon the Mohammedans to prayer—bells not being permitted in their religion—and is terminated with a spire or ornamental finial. The minarets are among the most beautiful features of Mohammedan architecture, and are an invariable accompaniment of the Mosques (q.v.). In India, *Minars*, or pillars of victory, are frequently erected in connection with mosques; some of these are lofty and splendid monuments, that of Kootub, at Old Delhi, being 48 ft. 4 inches in diameter at base, and about 250 ft. high. The form of the M. was derived from the Pharos (q.v.), the ancient light-house of Alexandria.

MINAS GERAES, *mĕ'nâs zhā-râ'ēs*, almost *zhā-rīs'*: interior prov. of s.e. Brazil; an extensive and elevated table-land; 220,160 sq. m., intersected by mountain-chains, which send out minor ridges in every direction, inclosing extensive valleys, of fertile soil, and watered by large rivers. The chief summits are Itambi, 5,950 ft., and Itacolumé, 5,750. The chief river is the São Francisco. The tropical situation of M. G. gives it luxuriant vegetation; forests rich in valuable timber and fine woods; and fields plentifully yielding corn, cotton, tobacco, coffee, millet, etc.; yet its elevation, about 2,000 ft. above sea-level, secures a healthful climate. The plains and the rich valleys furnish abundant pasture for cattle and hogs. Trade with adjacent states includes, export of coffee, tobacco, cotton fabrics, bacon, cheese, hogs, cattle, drugs, and precious stones; and import of wheat, flour, wine, salt, and manufactures. Manufactures are largely carried on, and embrace cotton and woolen goods, iron, rum, sugar, tobacco, wool, hats, etc. Communication from Rio de Janeiro, cap. of Brazil, is by a branch of the great Dom

MINATITLAN—MINCH.

Pedro II. r.r., built by the state, at a cost of \$50,000,000, to connect M. G. and San Paulo, the most populous and prosperous province of Brazil, with the cap. The branch to M. G. passes from Entre Rios over the ranges of intervening mts. to Ouro Preto. There is a lack of good roads, necessitating the carriage of goods on the backs of mules. The formerly rich gold mines of M. G., the most valuable in Brazil, whence the name M. G. had its origin, have been mostly abandoned, either agriculture or diamond-mining being preferred, and the govt. having, at the discovery of diamonds, 1746, compelled closing of the gold mines in favor of the search for diamonds.

The history of M. G. as a prov. dates from 1833. It is divided into 14 districts; the cap. is Ouro Preto; other towns are Minas Novas, Mariana, Januaria, Diamantina, Sao Joao d'El Rey, etc. The chief towns have colleges, and a system of primary and grammar schools extends through the prov. Pop. (1888) 3,018 807.

MINATITLAN, *mē-nâ-tē-tlân'*: town of Mexico, on the n. side of the Isthmus of Tehuantepec; 20 m. from the coast, by way of Coatzacoalcos river, on whose w. bank it is built, on low ground subject to periodical inundations. Cattle are raised, and these, with mahogany and other valuable woods, are its chief wealth. They are shipped at Vera Cruz, 125 m. n.w. Its connection by river with the Gulf of Mexico has suggested M. as the point of departure for an interoceanic canal across the isthmus, and also of a r.r. across to the Pacific.

MINATORY, a. *mīn'ă-tēr-ī* [L. *minatōriūs*, threatening—from *minārī*, to threaten]: threatening; menacing.

MINCE, v. *mīns* [OF. *mincer*, to cut into small pieces: F. *mince*, thin, slender: It. *minuzzare*; F. *menuiser*, to break or cut small]: to cut or chop into small pieces; to walk with affected nicety; to omit a part for the purpose of suppressing the truth; to palliate; to extenuate; to speak with affected softness, and imperfectly. MINCING, imp. *mīn'sing*: ADJ. having the character of that which minces; that chops into small pieces: N. affectation. MINCED, pp. *mīnst*: ADJ. chopped into very small pieces. MIN'CINGLY, ad. *-lī*, in small parts; not fully; affectedly. MINCE-MEAT, a sweetmeat whose principal ingredients are raisins, currants, brandy, etc., and a small portion of finely cut meat. MINCED-MEAT, meat cut or chopped fine; the state of being nearly or wholly destroyed, as if cut into *minced-meat*. MINCE-PIE, a pie or pastry containing mince-meat. NOT TO MINCE MATTERS, neither to suppress, extenuate, or weaken the force of, as of the words of another.

MINCH, *mīnch*: channel separating the island of Lewes from the counties of Cromarty and Ross, in n.w. Scotland. Its shores are exceedingly irregular; average width is about 28 m. The *Little Minch*, separating the island of Skye from that of North Uist and the neighboring islands in the Outer Hebrides, is more than 15 m. in width.

MINCIO, *mīn'chō* (anc. *Mincius*): river of n. Italy, continuation of the Tyrolese stream, the Sarca. It emerges from Lake Garda at Peschiera, and after a course of about 38 m. through the province of Mantua, which it separates from Verona, falls into the Po, 8 m. below the city of Mantua. The M. has constituted an important basis of operation during the wars between Italy and Austria.

MIND, n. *mīnd* [AS. *gemynd*, memory, mind: Icel. *minni*, memory; *minna*, to remember: Ger. *meinen*, to think: Gael. *meinn*, mind: L. *mens* or *mentem*, mind; *memīnī*, I remember]: intelligent power; the understanding; the power by which we perceive, think, or reason; intention; choice; purpose; thoughts; opinions; remembrance; recollections: V. to attend to; to regard with attention; to obey; to incline; to be inclined, as do you mind going; in *OE.*, to remind. MIND'ING, imp. MIND'ED, pp.: ADJ. disposed; inclined—much used in composition, as in *high-minded*, *low-minded*, *feeble-minded*, *double-minded*. MIND'LESS, a. -lēś, stupid; heedless. MIND'EDNESS, n. -nēs, inclination toward anything. MINDFUL, a. *mīnd'fūl*, attentive; heedful; observant. MIND'FULLY, ad. -lī. MIND'FULNESS, n. -nēs, the quality of being mindful; regard. TO MAKE UP ONE'S MIND, to come to a decision; to determine. NEVER MIND, do not regard; it is of no consequence.—SYN. of 'mind, n.': intellect; spirit; soul; capacity; liking; inclination; affection; disposition; sentiments; memory;—of 'mind, v.': to notice; mark; regard; observe; attend to; heed.

MIND: indefinitely comprehensive term for the faculties of spiritual being—including thought, memory, reason, judgment, conscience, emotion, imagination, perception, consciousness, will, etc. (see these and related titles). In definition or precise demarkation of M. as a whole, we cannot resort to the common method of defining, which is to assign something more simple and fundamental than the thing to be defined; as when we define gravity to be an *attractive force*, the notions of force and attraction being supposed to be more intelligible than gravity. M. can be resolved into nothing more fundamental than itself; and therefore our plan must be to call attention to those individual facts or experiences that are pointed at by the name, and to circumscribe, in some way, the whole field of such experiences. For an example of M., we should probably refer each person to his own pleasures and pains, which are a class of things quite apart and peculiar; we should also indicate thoughts or ideas, as mental elements; also exercises of will or voluntary action. There is sufficient community of nature in those various elements to cause them to be classed by themselves, under a common designation, namely, mind. If any one could be made aware of all the phenomena that have received this designation, he would of course know the meaning in the detail; but this is not enough. M. being a gen-

eral or comprehensive name, we ought to see distinctly the common character or attribute pervading all those particular phenomena; the recognition of this common character is the knowledge of M. in general, or the determination of its defining attribute. For the settling of this common attribute, we have another great resource, besides comparing the individual facts—that is, to determine the opposite, or contrast of mind. The usually assigned contrast is *matter*; but some, seeking a more precise term, prefer to assign the contrast as extension, or *the extended*, including both inert matter and empty space. When we are either conscious or aware of any object as having the property of Extension, our consciousness or our cognition is occupied with the object world, or something that is not mind. When we are feeling pleasure or pain, remembering, or willing, our M. is not in that act necessarily concerned with anything that is *extended* or that has a relation to space; we are said to be in a state of subjective consciousness, or to be exhibiting a phenomenon of M. proper. Hence, some philosophers speak of the *inextended mind*, as distinguished from the outer or object world. In one sense, everything that we can take cognizance of is M. or self; we cannot by any possibility transcend our own mental sphere; whatever we know is our own M. as it may stand affected by outward objects; hence the idealism of Berkeley, which seemed to annihilate the whole external universe. But this large sense of M. is not the usual sense; and whatever view we take of the reality of the external world, we must never merge the distinction between the consciousness of the cognition of the Extended—which is coupled with other truly object properties, e.g., inertia, for matter—and the consciousness of the Inextended, as constituting our feelings and thoughts. This opposition is fundamental and ineradicable, and is expressed in language by a variety of designations; mind and not mind, subject and object, internal and external. The laws and phenomena of the Extended are set forth in the sciences of the external world—Mathematics, Mechanics, Chemistry, etc.; the laws of the M. proper, or the Subject consciousness, are quite distinct in their nature, and are embodied in a separate science, called Mental Philosophy, Psychology, etc.—See PSYCHOLOGY: SOUL.

MINDANA'O: see PHILIPPINE ISLANDS.

MIND'-CURE: see SCIENCE, CHRISTIAN.

MINDEN, *mǎn'dén*: Prussian town, province of Westphalia, on the Weser, abt. 22 m. w.s.w. of Hanover. It is one of the oldest towns in Germany, a prosperous closely-built city; and was till lately a fortress of the second class. M. has a stone bridge across the river, dating from 1518, and possesses several ancient churches, the most noteworthy of which is the present Rom. Cath. church, built in the second half of the 11th c., and till 1811 an episcopal cathedral. A battle was fought near

MINDORO—MINER.

M. 1759, in which the French were defeated by an army of Anglo-Hanoverian troops.—Pop. (1880) 17,867.

For the Hanoverian town of M., properly MÜNDEŃ, see that title.

MINDO'RO: see PHILIPPINE ISLANDS.

MINDSZENT, *mĭnd'sĕnt*: town of Hungary, county of Csongrad, near the left bank of the Theiss, and just below the mouth of the Saros, 19 m. n. from Szegedin. Pop. (1880) 10,859.

MINE, pron. *mĭn* [AS., Sw. and Dan. *min*; Icel. *minn*; Goth. *meins*; Ger. *mein*, my or mine]: the possessive case of the pronoun of the first person; belonging to me; my; that which belongs to me; in Scripture language and in old style, *mine* is put before a noun beginning with a vowel, as, *mine* iniquity.

MINE, n. *mĭn* [F. *miner*, to dig underground, to mine—from mid. L. *minārĕ*, to conduct, as along a vein of metal: Gael. *meinn*; W. *mwyn*, ore, a mine: It. *mina*; F. *mine*, a mine]: pit or excavation in the earth, from which ores are dug (see MINES, in Law: MINING): any rich source of wealth or good; an excavation filled with gunpowder for the purpose of blasting rocks, or in war for blowing up an enemy's works (see MINES, MILITARY): V. to sap; to form mines under; to excavate. MĪ'NING, imp.: ADJ. pertaining to or connected with the forming of mines: 'N. the art of making pits for the discovery of ores, etc., and everything relating to their systematic management (see MINING, below). MINED, pp. *mĭnd*. MINER, n. *mĭ'nĕr*, one who works in a mine. MĪ'NY, a. -*nĭ*, abounding with mines or excavations.

MINEO, *mĕ-nā'ō*: town of the island of Sicily, province of Catania, 82 m. s.w. of Messina. It is supposed to occupy the site of the ancient *Mene*, founded by Ducetius B.C. 459. Pop. 9,500.

MINER, *mĭ'nĕr*, ALONZO AMES, D.D., LL.D.: clergyman, educator, and reformer: b. 1814, Aug. 17, Lempster, N. H. He studied at an acad., and 1830-35 spent part of the time in teaching, in the latter year becoming principal of an acad. at Unity, N. H. In 1839 he received ordination as a Universalist minister. He has held pastorates in Mass. at Methuen, Lowell, and Boston, labored in the anti-slavery and temperance causes, and been prominently connected with the educational interests of the state. He was pres. of Tufts College 1862-74, has been a member of the board of overseers of Harvard College, and was candidate for gov. of the state on the prohibitionist ticket 1878. He founded the Universalist publication house at Boston, edited the *Star of Bethlehem*, and has written for various periodicals. Among his published works are *Old Forts Taken*, and *Bible Exercises*.

MINERAL—MINERAL KINGDOM.

MINERAL, n. *măn'ér-ăl* [F. *minéral*, a mineral—from *miner*, to mine: Sp. *mineral*, a mineral (see MINE 2)]: any inorganic body which is found on the surface or within the earth; a rock or stone; a metallic ore; a metal: **ADJ.** of or relating to minerals; impregnated with minerals; formed in or dug out of the earth. **MINERALIZE**, v. *măn'ér-ăl-îz*, to impregnate with mineral matter; to convert into a mineral. **MIN'ERALIZING**, imp. **MIN'ERALIZED**, pp. *-îzd*. **MIN'ERALIZER**, n. *-î-zér*, a substance which combines in an ore. **MIN'ERALIZA'TION**, n. *-î-ză-shŭn*, the process of converting any substance into a mineral; the process of impregnating with a mineral. **MIN'ERALIST**, n. *-îst*, one versed in or employed about minerals. **MINERAL ACIDS**, in medicine, ordinarily the following: Sulphuric Acid (q.v. *Sulphates*), Nitric Acid (q.v.), Hydrochloric Acid (q.v.), Phosphoric Acid (q.v. **PHOSPHORUS**), Chromic Acid (q.v.), Carbonic Acid (q.v.). **MINERAL-BLUE**, the name usually given to *azurite* when reduced to an impalpable powder for coloring purposes. **MINERAL-CAOUTCHOUC**, *-kô'chôk*, an elastic mineral pitch, a variety of bitumen, resembling caoutchouc in elasticity and softness—also called *elaterite*. **MINERAL CHAMELEON** (see **MANGANESE**). **MINERAL-CHARCOAL**, a term applied to silky fibrous layers of charcoal, which are interlaminated in beds of ordinary bituminous coal—known to miners as mother-of-coal. **MINERAL DEPOSITS**, term denoting metalliferous ores occurring naturally in geological formations: they consist sometimes of a single native metal, but usually of different metals mixed (see **GANG** or **GANGUE: ORES: VEINS**, in **Geology: MINING**: also **MINERALOGY: GEOLOGY**). **MINERAL-GREEN**, a native green carbonate of copper. **MINERAL-OIL**, a familiar term for petroleum or rock-oil, which is found oozing out from strata of all ages, from the Silurian and Devonian upward. **MINERAL RESINS** (see **RESINS**). **MINERAL-TALLOW**, a familiar term for *hatchetine*, remarkable substance found in several places in Britain, Germany, Siberia, etc.; soft and flexible, yellowish white or yellow, resembling wax or tallow, often flaky like spermaceti, inodorous, melting at 115°–170° F., and composed of about 86 carbon and 14 hydrogen. **MINERAL WATER**, water naturally impregnated with mineral matter (see below): also certain beverages artificially prepared (see **AËRATED WATERS**).

MINERAL KINGDOM: inorganic portion of nature. Under this term, however, are not included the immediate inorganic products of organic beings—e.g., sugar, resins, etc., though substances more remotely of vegetable or even animal origin are reckoned among minerals, as coal, fossils, etc. To the M. K. belong liquid and gaseous, as well as solid substances; water, atmospheric air, etc., are included in it. All the chemical elements are found in the M. K., from which vegetable and animal organisms derive them; but many of the compounds which exist in nature belong entirely to the vegetable and animal kingdoms, and are produced by the wonderful chemistry of life.

MINERALOGY, n. *mĭn'ér-ăl'ô-jĭ* [Eng. *mineral*, and Gr. *logos*, discourse]: science which treats of the properties and relations of the various simple mineral substances which enter into the composition of the crust of the globe; art of classifying and describing mineral bodies. MIN'ERALOG'ICAL, a. *-ă-lôj'ĭ-kăl*, pertaining to minerals. MIN'ERALOG'ICALLY, ad. *-lĭ*. MIN'ERAL'OGIST, n. *-ăl'ô-jĭst*, one versed in the science of minerals.—*Mineralogy* does not embrace all that relates to the mineral kingdom. *Simple minerals* alone, or homogeneous mineral substances, are regarded as the subjects of M.; rocks formed by the aggregation of simple minerals, and their relations to each other, are the subjects of Geology (q.v.). This limitation of the term M. is comparatively recent: geology or geognosy was formerly included in it. The arrangement and description of simple minerals according to their external characters has been called by Werner and others *Oryctognosy*, but the term has fortunately fallen into disuse. The study of mere external characters is not sufficient in M.: the chemical composition of minerals equally demands attention. In the classification of minerals, some mineralogists, e.g., Mohs and Jameson, have regarded only the external characters, and some, as Berzelius, only the chemical composition; but the results have been unsatisfactory, and the present tendency is in favor of a system which seeks to constitute natural groups by having regard to both.

Some minerals being of great use, and others highly valued for beauty, have received much attention from the earliest ages. But the ancient naturalists describe few minerals. The first attempt at scientific M. was by George Agricola, 16th c. The systems of the Swedes Wallerius and Cronstedt, in the latter half of the 18th c., were the first worthy of the name. That of Werner followed, and was extensively adopted. The discoveries of Haüy in crystallography, and the progress of chemistry, gave M. a new character; and then sprung up two schools of mineralogists, one resting chiefly on external characters, and the other on chemical composition.

The chemical classification of minerals is rendered difficult by the endless variety of combination and proportion in the elements of which they are composed, the presence of substances not essential to the mineral, and yet more or less affecting its characters, and the frequent impossibility of determining what is to be deemed essential, and what accidental. Chemical purity is almost never found in nature. Even the purest diamond, when burned, leaves some traces of ash; and the various colors of diamond, quartz, and other minerals are due to the presence of substances often in quantity so small as not to affect their crystalline forms or other physical properties. Again, some minerals of identical chemical composition differ in their crystallization, so that an arrangement founded on it would separate them too widely. There are also many minerals which are often found in an uncrystallized state, and others which are always so.

MINERAL POINT.

In the arrangement of minerals into natural groups, their chemical composition, though not alone to be regarded, is of the first importance, so that the place of a new mineral in the system can never be determined without analysis; and in determining the nature of a mineral, chemical tests, such as the application of acids, are continually resorted to. It is necessary to know also its specific gravity, and how it is acted on both by a moderate heat and by the blowpipe. An examination of the crystalline forms, with measurement of the angles of the crystals, is often sufficient to distinguish minerals which have otherwise much resemblance. The *cleavage* of crystals also is important, a readiness to split in planes parallel to certain of their faces only, by which the *primitive form* of the crystal may be ascertained. Minerals not crystallized exhibit important varieties of *structure*, as *laminated*, *fibrous*, *granular*, etc. Certain peculiarities of *form* also are frequently characteristic of uncrystallized minerals, as *mamillary*, *botryoidal*, etc. Minerals exhibit, when broken, very different kinds of *fracture*, as *even*, *conchoidal*, *splintery*, etc. *Opaqueness*, *translucency*, and *transparency* are more or less characteristic of different kinds: *electric* and *magnetic* properties demand attention; and very important characters are derived from *lustre*, which in some minerals is *metallic*, in others *semi-metallic*, in others *pearly*, *vitreous*, etc. *Color* is not generally important, but in some minerals it is very characteristic. *Hardness* and *tenacity* are very important, and are of all various degrees. A few fluid, and even a few gaseous substances, are included in mineralogical systems. *Unctuousity* and other peculiarities ascertained by the touch are very characteristic of some minerals; peculiarities of *taste* and *smell* belong to others.

M. has very important relations with geology, which cannot be studied without regard to the mineral constituents of rocks. The mineral composition of soils greatly affects vegetation and agriculture. The economical uses of minerals also are very important and various; e.g., coal, lime, salt, and the metallic ores. Naphtha, petroleum, bitumen, asphalt, etc., are of well-known utility; and a high value has always been attached to gems and other ornamental stones.

MINERAL POINT: city, cap. of Iowa co., Wis., in a remarkably rich mineral region, about 175 m. n.w. of Chicago, 45 m. w. and s. of Madison. Lead, copper, and zinc are obtained in large quantities. There are various mills, iron foundries, smelting works, breweries, and a car manufactory. A railroad to Warren, Ill., connects with the Illinois Central railroad. There are six churches, a seminary, high school, two newspapers, two banks, and several hotels. Pop. (1890) 2,694; (1900) 2,991.

MINERAL WATERS.

MINERAL WATERS, NATURAL: usual term for all spring waters which possess qualities in relation to the animal body different from those of ordinary water (which itself also is ranked in the mineral kingdom). **Artificial M.W.**, usually imitations of some natural waters, are very largely manufactured, and are of service in some cases; but in curative effect they are not to be compared with the natural product: see **AÉRATED WATERS**. **M. W.** have been used as remedial agents from a very early period. The oldest Greek physicians had great faith in their curative power, and the temples erected to *Æsculapius* were usually in close proximity to mineral springs; they had recourse to the sulphurous thermal springs of Tiberias (now Tabareah), still used by patients from all parts of Syria in cases of painful tumor, rheumatism, gout, palsy, etc.; and to the warm baths of Calirrhoe, near the Dead Sea, mentioned by Josephus as tried by Herod in his sickness. We are indebted to the Romans for the discovery not only of the mineral thermic springs in Italy, but of some of the most important in other parts of Europe, e. g., Aix-la-Chapelle, Baden-Baden, Bath, Spa in Belgium, and many others; and Pliny, in his *Natural History*, mentions a very large number of mineral springs in almost all parts of Europe.

The therapeutic action of **M. W.**, or of spas, as they are frequently termed, depends chiefly on their chemical composition and their temperature, though a variety of other circumstances, as situation, elevation, climate, geological formation, mean temperature, etc., have important bearing on the success of the treatment.

The best time for undergoing a course of **M. W.** is, in n. temperate regions, in the majority of cases, during June, July, August, and September. There are, however, exceptions depending on climate; e.g., at Gastein (q.v.), famed for thermal springs, the weather is changeable and stormy in June and July, but pleasant in May, August, and September. Early rising is usually advisable during a course of **M. W.**, and, as a general rule, the water should be drunk before breakfast, at intervals of about a quarter of an hour between each tumbler, moderate exercise being taken in the intervals. In many cases, bathing is of even greater importance as a remedial agent than drinking. Baths are taken usually between breakfast and dinner; and should never be taken soon after a full meal. The time during which the patient should remain in the bath varies much at different spas, and the directions of the local physician should be strictly attended to on this point. It is impossible to determine beforehand how long a course of **M. W.** should be continued, as this entirely depends on the symptoms observed during treatment; but as a general rule, the treatment should not be protracted beyond six weeks or two months, and in some cases this is too long; but on this point the patient must be guided by the physician resident at the spa, or by one who knows both the water and the patient. Indulgence in the pleasures of the table,

and excesses of any kind, frequently counteract all salutary effects of the waters, while perfect mental relaxation is an important auxiliary to the treatment. Spas are suitable remedies for only *chronic* disorders; though among such disorders are to be ranked weariness and languor from over-work, mental or bodily, not as yet developed into marked symptoms of any disease.

No classification of M. W. based on their chemical composition can be strictly exact, because many springs are intermediate between well characterized groups. The following classification, adopted by Dr. Althaus, *Spas of Europe* (Lond. 1862), is perhaps the most convenient: 1. Alkaline Waters; 2. Bitter Waters; 3. Muriated Waters; 4. Earthy Waters; 5. Indifferent Thermal Waters; 6. Chalybeates; 7. Sulphurous Waters.

1. The Alkaline Waters are divisible into: (a) *Simple Alkaline Acidulous Waters*, of which the chief contents are carbonic acid and bicarbonate of soda. The most important European spas of this class are the thermal springs of Vichy and the cold springs of Fachingen, Geilnau, and Bilin (q.v.). These waters are useful in certain forms of indigestion, in jaundice from catarrh of the hepatic ducts, in gall-stones, in renal calculi and gravel, in gout, in chronic catarrh of the respiratory organs, and in abdominal plethora. Vichy (q.v.) may be taken as representative of this class of springs. (b) *Muriated Alkaline Acidulous Waters*, which differ from the preceding sub-group in additionally containing considerable chloride of sodium. The most important spas of this kind in Europe are the thermal springs of Ems (q.v.), and the cold springs of Selters (q.v.), Luhatschowitz, and Salzbrunn (q.v.). They are useful in chronic catarrhal affections of the bronchial tubes, the stomach, and the intestines, and the larynx; and the Ems waters have high repute in certain chronic diseases of the womb and adjacent organs. (c) *Alkaline Saline Waters*, of which the chief contents are sulphate and bicarbonate of soda. The most frequented are the warm springs of Carlsbad (q.v.) and the cold springs of Marienbad (q.v.). Patients suffering from abdominal plethora are those most frequently sent to these spas, which often prove of great service, if the stagnation of the blood is owing to habitual constipation, pressure from accumulated fæces, or congestion of the liver, unconnected with diseases of the heart or lungs. These waters, especially those of Carlsbad, afford an excellent remedy for the habitual constipation frequently arising from sedentary occupations; the result being much more permanent than that produced by strong purgative waters.

2. The chief contents of the Bitter Waters are the sulphates of magnesia and soda; and the best known spas of this class are those of Püllna, Saidschütz, Sedlitz, Friedrichshall, and Kissingen (q.v.); though there are two English spas—the bitter water of Cherry Rock, near Kingswood, in Gloucestershire, and the Purton Spa, near Swindon, in Wiltshire—which ‘are, by their chem-

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ical composition, admirably suited for the treatment of many cases of disease, and may perhaps even prove superior to the continental spas of this class.'—Althaus, *Spas of Europe*, 360. These waters act both as purgatives and diuretics, and may therefore be used advantageously in the numerous cases in which it is advisable to excite the action both of the bowels and of the kidneys.

3. The Muriated Waters are divisible into: (a) *Simple Muriated Waters*, of which the chief contents are a moderate quantity of chloride of sodium or common salt. The chief spas of this class are Wiesbaden (q.v.) and Baden-Baden (q.v.), which are hot; those of Soden (in Nassau), of Mondorf (near Luxembourg), and of Canstatt (near Stuttgart), which are tepid; and those of Kissingen (q.v.), Homburg (q.v.), and Cheltenham (q.v.), which are cold. The muriated saline springs of Saratoga, N. Y., are some of them chalybeate, others sulphurous or iodinous; all being rich in carbonic acid gas: they are used chiefly in cases of gout, rheumatism, scrofula, and abdominal plethora. (b) *Muriated Lithia Waters*, of which the chief contents are the chlorides of sodium and lithium. In gout, they first aggravate the pain, but then give relief; and in periodic headache, they have been found serviceable. (c) *Brines*, whose chief contents are a large amount of chloride of sodium or common salt. Among the spas of this kind in Europe, those of Rehme in Westphalia, and Nauheim in Hesse, have the greatest reputation. They are employed mostly for bathing, and are often of much service in scrofula, anæmia, rheumatism, certain forms of paralysis, and catarrh of the mucous membranes. (d) *Iodo-bromated Muriated Waters*, in which, besides a moderate quantity of chloride of sodium, the iodides and bromides of sodium and magnesium are contained in an appreciable quantity. Kreuznach (q.v.) is the most celebrated of this class. Its waters are used both for drinking and for bathing, and are of service in scrofulous infiltrations of the glands, in scrofulous ulcers, in chronic inflammation of the uterus and ovaries, etc. The waters of Hall, in Austria Proper, also are of this class, and have high reputation in cases of bronchocele or goitre.

4. Earthy Waters, of which the chief contents are sulphate and carbonate of lime. The most important European waters of this class occur at Wildungen, Leuk (q.v.), Bath, Eng. (q.v.), Lucca (q.v.), and Pisa (q.v.). The Wildungen water, exported in large quantities, is, according to Dr. Althaus, 'a capital diuretic, and not only promotes the elimination of gravel and renal calculi, but by its tonic action on the mucous membrane of the urinary passages, serves to prevent the formation of fresh concretions. It is also much used for chronic catarrh of the bladder, neuralgia of the urethra and neck of the bladder, dysuria, and incontinence of urine.' The baths of Leuk, in which many patients remain nine hours daily (4 A.M. to 10 A.M., and 2 P.M. to 5 P.M.),

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until an eruption appears, are used chiefly in chronic skin diseases. The waters of Bath, Pisa, and Lucca, which are thermal, are useful in chronic skin diseases, scrofula, gout, rheumatism, etc.

5. Indifferent Thermal Waters, which usually contain a small amount of saline constituents. Of the spas of this class, the most important in Europe are Gastein (q.v.) (95° to 118°) Töplitz (q.v.) (120°) Wildbad (q.v.) (96°), Warmbrunn (100°), Clifton (86°), and Buxton (q.v.) (82°). Their most striking effects are to stimulate the skin and excite the nervous system. 'They are used especially in chronic rheumatism and atonic gout; in diseases of the skin, such as prurigo, psoriasis, lichen; in neuralgia and paralysis due to rheumatic and gouty exudations, to parturition, or to severe diseases, such as typhoid fever and diphtheria; in hysteria; and in general weakness and marasmus.'—Althaus, *Spas of Europe*, 421.

6. Chalybeate Waters, divisible into: (a) *Simple Acidulous Chalybeates*, whose chief contents are carbonic acid and bicarbonate of protoxide of iron; and (b) *Saline Acidulous Chalybeates*, whose chief contents are sulphate of soda and bicarbonate of protoxide of iron. For these, see CHALYBEATE WATERS.

7. Sulphurous Waters, which contain sulphuretted hydrogen or metallic sulphides (sulphurets), or both. The most important sulphurous thermals of Europe are those of Aix-la-Chapelle (q.v.), Baden (near Vienna), Barèges (q.v.), Eaux-Chaudes, and Bagnères de Luchon; while among the cold sulphurous springs, those of Nenndorf (in Hessen-Nassau) and Harrogate (q.v.) are of great importance. They are extensively used in chronic diseases of the skin, and are of service in many cases in which exudations require to be absorbed, as in swellings of the joints, in old gunshot-wounds, and in chronic gout and rheumatism. In chronic laryngeal and bronchial catarrh they frequently give relief, and in chronic poisoning by lead or mercury they favor the elimination of the poison, though to a far less degree than iodide of potassium taken internally. The sulphurous waters are employed externally and internally, and mineral mud-baths are believed by many physicians to form a valuable auxiliary to this treatment.

For further information on this subject, see Althaus; the *Dictionnaire Général des Eaux Minérales et d'Hydrologie Médicale*, by Durand-Fardel, Le Bret, and Lefort; and the very valuable work on the *Mineral Waters of Europe*, by Fichbourne and Prosser James (1883).

The chief simple alkaline springs of the United States are, the Bladon, Ala.; the Cal. Seltzer, Cal.; the Perry and Versailles, Ill.; the St. Louis, Mich.; the Sheldon (including Missisquoi), and the Weldon, Vt.; and the Des Chutes hot (143° to 145°), Oregon.

Of alkaline saline springs examples in the United States are, the Lansing well, Mich.; the Ballston spa, Saratoga co., N. Y., and the Albany artesian well, N. Y.; Milhoit's soda, Or.; and for thermal, the Idaho hot (85°

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to 115°), Colo.; and the Charleston artesian well (87°, 1,250 ft. deep), South Carolina.

Of purgative or bitter water springs in the United States there may be noted, the Crab Orchard, Ky., from which the Crab Orchard salts are made; the Estill or Irvine, Ky., the water of which is strongly charged with sulphate of magnesia: and the Harrodsburg, Ky., in the water of which the laxative effect is qualified by equal amounts of sulphate of lime and of carbonate of iron. The Bedford springs, Penn., are purgative-chalybeate.

The muriated class of waters is represented especially by the springs at Saratoga. These waters are charged with carbonic acid gas, together with bicarbonates of lime, magnesia, and iron, which result from the solvent power of the acid gas upon limestone and some other rocks. Hathorn is the strongest of the Saratoga waters. The Seltzer has the mild quality desirable for use with wines. The Congress is valuable as containing in the best proportions the substances which give both agreeable flavor and satisfactory medicinal effect. The Ballston Artesian Lithia spring furnishes the most concentrated water yet obtained in this country. All the Saratoga waters contain more or less bicarbonate of iron, and are thus chalybeate, though this character is masked by the greater amount of other mineral constituents. Springs allied to the Saratoga are, the Santa Clara Congress, Cal.; the Rockbridge Baths, Va.; the Capon Bath, W. Va.; the Artesian well, St. Louis, Mo. (2,199 ft. deep); the Spring Lake and Fruit Port wells, Mich., resembling very much the Creuznach, Prussia; and the St. Catherine's, Canada, the waters of which are similar but stronger.

Springs characterized by the presence of free mineral acids, as sulphuric or hydrochloric, are found in the United States and in S. America. The Rio Vinagre proceeds from such springs, and its waters carry off daily no less than about 70,000 lbs. of concentrated muriatic acid, and over 80,000 lbs. of oil of vitriol. The Oak Orchard acid spring in N. Y. is noted for the same sort of water.

Of calcic or earthy springs, examples in the United States are (1) thermal, the San Bernardino (100° to 175°), Cal.; the Agua Caliente (130°), N. Mex.; the Sweet and the Berkeley (both 74°), W. Va.; the Warm springs (97° to 102°), N. Car.; and the Bethesda, Wis.; (2), cold, the Butterworth, and the Leslie, Eaton Rapids, and Hubbardston wells, Mich.; the Yellow springs, O.; and the Gettysburg, Penn.

In the class of indifferent thermal, the noted United States waters are those of the Hot springs (57 of them, 93° to 150°), Ark.; the Healing, the Holston, and the Hot springs (the latter 102° to 108°), Va.; the Shasta co. Tuscan, Cal.; and the Lebanon, N. Y.

The chalybeate springs, characterized by bicarbonate of iron, or in the poorer waters by the sulphate, are represented in the United States by the Schooley's Mt.,

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N. J.; Fry's soda, Cal.; the Stafford, Conn.; the Greencastle, Ind.; the Catoosa, Ga.; the Selhuyler co., Ill.; the Owasso, Mich.; Cooper's well, Miss.; the Beersheba, Tenn.; the Rawley, Va.; and the Bayley, Ala. There are grouped with these the alum waters, found in the Rockbridge, the Pulaski, the Bath, the Stribbling, the Church Hill, the Bedford, and the Variety—all in Va.; and the Oak Orchard acid, New York.

The United States have numerous examples of sulphur waters, as the White, Red, and Salt Sulphur springs of Va.; the White Sulphur springs of O.; and the Richfield, Sharon, Chittenango, and Florida springs of N. Y.

Silicious waters, especially those of hot springs with a large charge of silica, are represented by the famous Geyser in Iceland, by the geysers of Cal., and by the still more famous hot springs of the Yellowstone Park, Mont., where hundreds are found, one of them throwing, in outbursts about 32 hours apart, a column of hot water 8 ft. in diameter and 200 ft. high.

Saline waters, in the form of the brines from which salt is made, occur most abundantly in Mich. and N. Y.; also in W. Va.; O.; and Kan. The brine at Syracuse, N. Y., is pumped up from wells 400 to 500 ft. deep. A peculiar type of M. W. is found where a heavy charge of biborate of soda, or borax, is present. Lakes of great size have been found in Cal., the water of which is very rich in borax, apparently supplied to them by hot springs.

There are numerous other springs, not strongly marked in a chemical analysis, but found practically valuable, and therefore favorite with the public: a specimen of these is the Poland spring, Maine.

MINERVA, n. *mĭn-ĕr'va* [L. *Minerva*—from L. root *men*; Skr. *man*, to think]: in Roman mythology, goddess of wisdom; identified by the later Græcizing Romans with the Greek *Athene*, whom she greatly resembled, though, like all the old Latin divinities, which were abstractions, there was nothing anthropomorphic in what was told concerning her. The ancient Latin scholar and critic, Varro, regarded M. as the impersonation of divine thought—the plan of the material universe of which Jupiter was creator, and Juno representative: in this view, all that goes on among men, all that constitutes the development of human destiny (which is but the expression of the divine idea or intention), would be under her care. She was the patroness of arts, sciences, handicrafts, and inventions; and was invoked alike by poets, painters, teachers, physicians, and all kinds of craftsmen. She also guides heroes in war; and wise, bold and useful designs were ascribed to the inspiration of this virgin goddess.



Minerva:

From Colossal Head in
British Museum.

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Her oldest temple at Rome was that on the Capitol, but she had another on the Aventine. Her festival was in March, five days, 19th to 23d inclusive.

ATHENE, or PALLAS ATHENE, the Greek goddess corresponding to the Roman Minerva, was one of the few really grand *ethical* divinities of Greek mythology. Different accounts are given of her origin and parentage, probably from the jumbling together of local legends; but the best known, and in ancient times, the most orthodox version of the myth represented her as daughter of Zeus and Metis. Zeus, we are told, when he had attained supreme power after his victory over the Titans, chose for his first wife Metis (Wisdom); but being advised by both Uranus and Gæa (Heaven and Earth), he swallowed her when she was pregnant with Athene. When the time came that Athene should have been born, Zeus felt great pains in his head, and caused Hephæstus (Vulcan) to split it up with an axe, when the goddess sprang forth—fully armed, according to the later stories. Throwing aside the thick veil of anthropomorphism which conceals the significance of the Grecian myth, we may see in this account of Athene's parentage an effort to set forth a divine symbol of the combination of power and wisdom. Her father was the greatest, her mother the wisest of the gods. She is literally born of both, and so their qualities harmoniously blend in her. It is possible that the constant representation of her as a strictly maiden goddess, who had a *real*, and not merely a *prudish* antipathy to marriage, was meant to indicate that qualities like hers could not be mated, and that, because she was perfect, she was doomed to virginity. She was not, however, a cold, unfeeling divinity; on the contrary, she warmly and actively interested herself in the affairs of both gods and men. She sat at the right hand of Zeus, assisting him with her counsels; she helped him in his wars, and conquered Pallas and Encelados in the battles of the giants. She was the patroness of agriculture, invented the plow and rake, introduced the olive into Attica, and (in harmony with her character as the personification of active wisdom) taught men the use of almost all the implements of industry and art; and is said to have devised nearly all feminine employments. Philosophy, poetry, and oratory also were under her care. She was the protectress of the Athenian state, was believed to have instituted the court of justice on Mars' Hill (the Areiopagus). As a warlike divinity, she was thought to approve of those wars only which were undertaken for the public good, and conducted with prudence; and thus she was regarded as the protectress in battle of those heroes who were distinguished as well for wisdom as valor. In the Trojan wars, she favored the Greeks—who, in fact, were in the right. Her worship was universal in Greece, and representations of her in statues, busts, coins, reliefs, and vase-paintings were and are numerous. She is always clad, generally in a Spartan tunic, with a cloak over it,

and wears a helmet, beautifully adorned with figures of different animals, the ægis, the round Argolic shield, a lance, etc. Her countenance is beautiful, earnest, and thoughtful, and the whole figure majestic.

MINERVA-PRESS, n. *mĭn-ér'va-prĕs*: in *bibliog.*, name of a printing-press formerly in London; also a series of ultra-sentimental novels issued from this press at the close of the 18th and the beginning of the 19th century.

MINERVINO, *mĕ-nĕr-vĕ'nō*: town of s. Italy, province of Bari, called the *Balcony of Puglia*, from the extensive view it commands of several cities. It stands on a fine hill, and has excellent air. Pop. (1881) 15,163.

MINES, in Law: mineral deposits as affected by governmental provisions as to ownership, claims, etc. In England the crown has the right to all M. of gold and silver; but where these metals are found in M. of tin, copper, iron, or other base metal, then the crown has the right to take the ore only at a price fixed by statute. As a general rule, whoever is owner of freehold land, has a right to all the M. underneath the surface, for his absolute ownership extends to the centre of the earth. When the land is given by will or otherwise to a tenant for life, while a third party has the reversion, then the tenant for life is held not entitled to open M. which have never before been opened, but he may carry on such as have been open. So in lease of lands for agricultural purposes, if nothing is said as to M., the tenant is not entitled to open any M., for that would be committing waste. It is not uncommon for one person to be owner of the surface of the land, and another to be owner of the M. beneath; or several persons may be owners of different kinds of M. lying above each other in different strata. The courts have determined that even though the owner of the land whose surface has been sold to a railway, reserve his right to minerals, he is nevertheless prevented by common law from working the M. immediately under the railway in a manner to endanger its use.

In the United States, the royal charters to the colonies of Mass., R. I., Conn., Penn., Md., and Va., conveyed all M., but reserving to the crown one-fifth of all ores of gold and silver. The continental congress, 1785, reserved to the general govt. one-third of gold, silver, lead, and copper M.; but this regulation was not long operative. Since 1866, by law of congress, all public mineral lands are freely open to be explored and occupied, under due and necessary regulations, local or federal. A law passed 1872 covers all the important points as related to the general government; but the differing mining laws of various western states must be referred to respectively in each case of use and occupancy of mineral lands.

Recent acts of parliament insure the greater safety of persons working them, and prevent the employment of women and children. Owners of mines are prohibited

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from employing any woman or boy under 10 years of age underground. Boys under 16 can be so employed only ten hours per day, and boys under 12 must attend school at certain times. No owner or worker of a mine or colliery is allowed to pay the wages of the men at any tavern, public-house, beer-shop, or place of entertainment, or any office or outhouse connected therewith. No person under 18 is to be employed at the entrance of any mine, to have charge of the steam-engine or windlass, or other machinery and tackle for letting down and bringing up the men. Inspectors are appointed by government for the express purpose of visiting mines, and seeing that the statutes are complied with.—In the United States, laws varying in details, but to the same general purport, have been enacted in the different states.

MINES, MILITARY: important department in military engineering, and formidable accessory in the attack and defense of fortresses. A military mine consists of a gallery of greater or less length, starting from some point of safety and extending under an opposing work, or under an area over which an attacking force must pass, and terminating in a chamber which, being stored with gunpowder, can be exploded at the critical moment. M. are of great use to the besiegers in the overthrow of ramparts and formation of a breach; the *countermines* of the besieged are equally serviceable in undermining the glacis over which the assaulting column must charge, and blowing them into the air, or in destroying batteries erected for breaching. But far above the actual mischief wrought by the mine—often very great—is its moral influence on the troops, especially on the assailants. The bravest soldiers, who advance without flinching to the very mouth of the cannon *which they see*, will hesitate to cross ground which they suppose to be undermined, and on which they may be dashed to destruction in a moment, without the power of averting the *unseen* danger. The first employment of M. was very ancient, and consisted merely in obtaining an entrance to the interior of towns by passing beneath the defenses; but this soon fell into disuse, the chances of success being merely those of introducing a body of men before the besieged discovered the mine. The next use occurred during the middle ages, and was more destructive. The miners went no further than beneath the wall, then diverged to either side, and undermined the wall, say for about 100 ft. During the process, the wall was sustained by timber-props; and these being ultimately set on fire, the wall fell; and the besiegers, who had awaited the opportunity, rushed in at the breach. This use of M. of *attack* necessitated those of *defense*, which obtained in mediæval times, and have ever since kept the name '*countermines*.' The earliest subterranean defense consisted of a gallery surrounding the fort in advance of the foot of the wall, and termed an 'envelope-gallery.' From this the garrison would push forward small branches or tributary galleries, whence they

could obtain warning of the approach of hostile miners, and by which also they succeeded, at times, in overthrowing the battering-rams or towers of the besiegers.

Two centuries appear to have elapsed between the introduction of gunpowder into European warfare and its application to subterranean operations. The first instance occurred 1503, at the siege of the Castello del' Uovo, in the Bay of Naples, which a French garrison had succeeded in holding for three years against the combined Spanish and Neapolitan forces. At length, a Spanish capt., Pedro Navarro, devised a gallery into the rock, which he stored with powder, whereof the explosion, hurling portions of the rock and many of the besieged into the sea, caused the immediate capture of the place. At once the use of M. of attack spread throughout Europe; and so irresistible were they soon considered, that it was not unusual for the besieger, after preparing his mine, to invite the besieged to inspect it, with the view of inducing the latter at once to surrender. Defense soon availed itself of the new power, and retaining the envelope-gallery as a base, ran small countermines in many directions, to ascertain by hearing the approach of the enemy's sappers—their work being audible, to a practiced ear, at a horizontal distance of 60 ft. Small charges were then exploded, which, without creating surface disturbance, blew in the approaching gallery, and buried the sappers in its ruins. Thus commenced a system of subterranean warfare, requiring the greatest risk and courage, in which the operator was in constant danger of being suffocated. Of course, in such a system, the balance of advantage lay with the besieged, who had ample opportunities, before the siege commenced, of completing his ramifications in every direction, and, if desirable, of revetting them with masonry, which much diminished the chance of being blown in; while the assailant, no longer able to cross the glacis by an open zigzag trench, was compelled to engage in a most uncertain subterranean advance. The French engineer Belidor, in the 18th c., restored the advantage to the attack, by demonstrating that the explosion of a very large mass of powder in a mine which had not yet entered the labyrinth of defensive M., effected the destruction of the latter for a great space round, clearing the way with certainty for the hostile advance. Besides M. for explosion, tunnels are often dug as means of communication between different works, or between different parts of the same work, some being of size sufficient to permit the passage of four men abreast, of horses, and of artillery.

M. are either vertical—when they are called *shafts*—horizontal, or inclined, in either of which cases, they are *galleries*, the word 'ascending' or 'descending' being added, if there be inclination. The dimensions range from the 'great gallery,' six ft. six inches by seven ft., to the 'small branch'—the last diminutive of the gallery—which has but two ft. six inches height, with a breadth of two ft. The most frequent work is the 'common gal-

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lery,' four ft. six inches by three ft., which is considered the easiest for the miner.

The sapper's tools are numerous, but most in request are his shovel, pickaxe, and above all, his 'push-pick' (see fig. 1); he has besides a barrow, a small wagon, a lamp, and other accessories. As he advances, it is necessary to line his gallery, always at the top, and almost always at the sides. This he does either by frames—which resemble door-frames, and serve to retain horizontal planks or 'sheeting' in position against the earth—or by cases somewhat resembling packing-cases, of little depth, which are used to form the sides and top. With



Fig. 1.—Push-pick: cases, galleries are supposed to advance Length, 1 ft. 10 in. one ft. and a half per hour; while with frames, the progress is barely more than half that amount.

When a mine is exploded, the circular opening on the surface is called the *crater*; the *line of least resistance* is the perpendicular from the charge to the surface; the half-diameter of the crater is its radius; and the *radius of explosion* is a line from the charge to the edge of the crater, on the hypotenuse of the triangle, the revolution of which would form the cone. When the diameter equals the line of least resistance, the crater is called a one-lined crater; when it doubles that line, a two-lined crater; and so on. The common mine for ordinary oper-

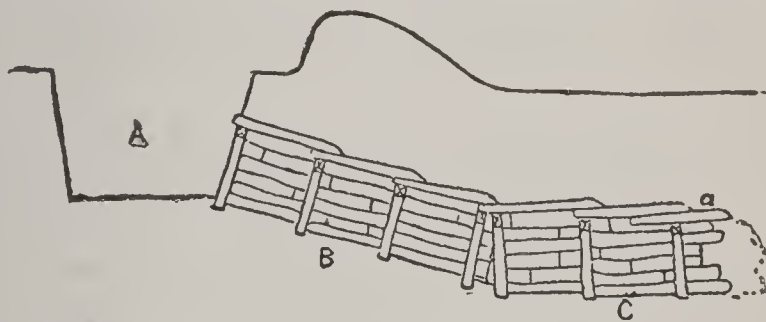


Fig. 2.—Mine supported by Frames, in process of construction from a Trench:

A, trench; B, descending gallery; C, gallery; a, roofing plank not yet pushed out to its full length.

ations is the two-lined crater; and for this the charge of powder should—in ground of average weight and tenacity—be in lbs. a number equal to one-tenth of the cube of the line of least resistance in ft.; e.g., at a depth of 18 ft., the charge should consist of 583 lbs. In sur-charged M., or globes of compression, as introduced by Belidor, vastly greater charges are employed, and craters of six lines are sometimes produced. The rules, in these cases, for computing the charges vary exceedingly, according to different engineers, and in every case are very complicated. Previous to the explosion, the gallery is filled up behind the charge, or *tamped*, with earth, sand-bags, etc., to prevent the force of the powder wasting itself in the mine. This tamping must extend backward for one

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and a half or twice the length of the line of least resistance. The mine is fired usually by means of a powder-hose, composed of strong linen inclosed in a wooden pipe laid carefully through the tamping, or by wires from a voltaic battery.

In the annexed figure (fig. 3), is shown a system of countermines. The magistral gallery, AAA, is immediately within the wall of the counterscarp, through orifices in which it derives light and air, and by its loop-holes, the defenders can take in rear any enemy who might obtain momentary possession of the ditch. Farther in advance, and reached by galleries of communication B, is the envelope-gallery C, from which radiate the listeners D, D. To prevent the enemy's advances, these

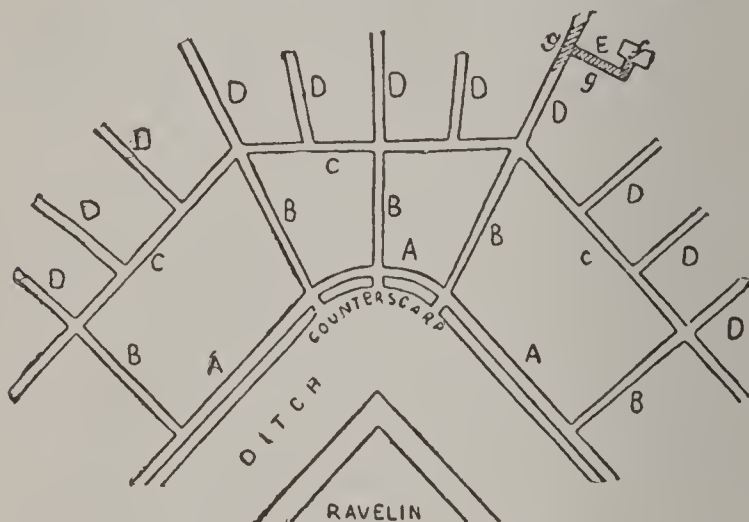


Fig. 3.—System of Countermines :

AAA, magistral gallery; BBB, galleries of communication; CCC, envelope-gallery; DDD, listeners; E, branch ending in chamber *f*.

listeners should not be more than about 54 ft. apart. Besides listening, they are used for aggressive purposes, such as driving branches and blowing in or up hostile works. Modern engineers object to the envelope-gallery, as affording too good a base to the enemy, should he obtain possession of it; and either dispense with it altogether, or merely retain it in short sections. At suitable points among the M., small magazines for tools and powder are formed; and at about every 30 yards, loop-holed doors of great strength are made, to stop the advance of an enemy, should he break into the galleries. In the course of their excavations, hostile miners frequently meet, or approach within a few feet: it becomes, then, merely a question of time which shall destroy the other; shells, pistols, pikes, and petards, as well as small mines, being used with murderous effect.

Provision is made for pumping foul air out of mines; but such military works are in general badly ventilated.

MINEVER, *n.* *mīn'ě-vér* [OF. *menuver*, a grayish fur: F. *menu*, small; *vair*, a kind of fur]: an animal, a variety of the ermine; its fur, which, in the middle ages, lined the robes of noblemen; also said to be fur obtained from a squirrel; spelt also MENIVER and MINIVER.

MINGHETTI—MINHO.

MINGHETTI, *mēn-gět'tē*, Cavaliere **MARCO**: Italian writer and statesman: b. 1818, Nov. 8, Bologna; of an opulent commercial family. Having finished his studies, he travelled, closely investigating the political, social, and economical institutions of France, Germany, and especially Britain. Returning, he published an essay advocating the free-trade views of Richard Cobden. In 1846, M. opened his political career by starting a journal of liberal tendencies, soon after Pius IX. became pope; in 1847, he was elected member of the *Consulta delle Finanze*, and in 1848 became minister of public works. Having speedily lost faith in public progress under the papacy, M. withdrew from office, and joined the army of Charles Albert in Lombardy, where he was appointed captain. After the battle of Goito, he was promoted major; and for his bravery at Custoza, he received from the king the cross of the Knights of St. Maurizio. After the war, M. gained the confidence of Cavour, and subsequently became sec. for foreign affairs, resigning with Cavour on the peace of Villafranca. M. became minister of the interior 1860, premier 1863, ambassador to London 1868, and was again premier 1873-76. His chief works are *Della Economia pubblica* (1859); *La Chiesa e lo Stato* (1878).

MINGLE, v. *mǎng'gl* [Dut. *mengelen*, to mingle—from *mengen*, to mix: Icel. *menga*, to mingle: Ger. *mengen*; AS. *mengian*; Gr. *mignuein*, to mix]: to unite into one body by mixing; to mix; to blend; to join in mutual intercourse or in society. **MIN'GLING**, imp. *-glǐng*. **MINGLED**, pp. *mǎng'gld*. **MIN'GLEDLY**, ad. *-gld-lǐ*. **MIN'GLER**, n. *-glēr*, one who mingles. **MINGLE-MANGLE**, a medley; a hotch-potch.

MINGRELIA, *mǎn-grē'lı-a*: former principality of Transcaucasia, corresponding to anc. Colchis (q.v.); on the Black Sea. It was formerly a part of Georgia, and later was under its own princes; but since 1867 has been included in the govt. of Kutais, Russia. It is mountainous and forest-covered, with valuable mineral deposits. The Mingrelians are of the Georgian race, and number abt. 200,000.

MINGRELIAN, n. *mǎn-grē'lı-an*: native or inhabitant of Mingrelia. In *chh. hist.*, Greek Christians, natives of Mingrelia, a part of Old Georgia, and followers of Cyrilus and Methodius. They do not baptize their children till the 8th year, and observe other peculiarities of ritual and discipline.

MIN'HO: see **ENTRE DOURO E MINHO**.

MINHO, *mēn'yō* (Span. *Minho*, anc. *Minius*): river of Spain and Portugal, rising in the n.e. of Galicia, lat. about 43° 20' n., lon. about 7° 15' w. Its course is s.w. through the modern Spanish provinces Lugo and Orense, after which, it forms the n. boundary of the Portuguese province of Minho, and empties into the Atlantic Ocean. Its length, exclusive of windings, is 130 m., and it is navigable for small craft 23 m. above its mouth.

MINIATURE.

MINIATURE, n. *mĭn'ĭ-tŭr* [F. *miniature*—from It. *miniatura*, a miniature—from L. *miniātus*, colored with *minium* or red-lead, as the ornaments of mss.]: any minute picture; a portrait of small dimensions; a name usually applied to portraits painted on a very small scale on ivory, etc., and in water-colors; red letter: ADJ. on a very small compass; minute.—*Miniature Painting* originated in the practice of embellishing manuscript books: see MANUSCRIPTS, ILLUMINATION OF. As the initial letters were written with red-lead (Lat. *minium*), the art of illumination was expressed by the low Lat. verb *miniare*, and the term *miniatura* was applied to the small pictures introduced. After the invention of printing and engraving, this delicate art entered on a new phase; copies, in small dimensions, of celebrated pictures came to be in considerable request, and there arose such demand in particular for M.-portraits, that a M., in popular language, is held to signify 'a very small portrait.' Soon after their introduction, M.-portraits were executed with very great skill in England. Holbein (1498–1554) painted exquisite miniatures, and having settled in London, his works had great influence in calling forth native talent. The works of Nicholas Hilliard (1547–1619, b. Exeter) are justly held in high estimation. Isaac Oliver (1556–1617) was employed by Queen Elizabeth and most of the distinguished characters of the time; his works are remarkable for careful and elaborate execution; and his son, Peter Oliver, achieved even a higher reputation. Thomas Flatman (1633–88) painted good miniatures. Samuel Cooper (1609–72, b. London), who was, with his brother Alexander, a pupil of his uncle, Hoskins, an artist of reputation, carried M.-painting to high excellence. Cromwell and Milton sat to him—he was employed by Charles II.—and obtained the highest patronage at the courts of France and in Holland. Till within a few years, M.-painting continued to be successfully cultivated in Britain; but it has received a severe check since photography was invented, and most of the artists of the present time, who exercised their talents in this exquisite art, have left it for other branches of painting. As to technical details, the early artists painted on vellum, and used body-colors, i.e., colors mixed with white or other opaque pigments, and this practice was continued till a comparatively late period, when thin leaves of ivory, fixed on card-board with gum, were substituted. Many of the old M.-painters worked with oil-colors on small plates of copper or silver. After ivory was substituted for vellum, transparent colors were employed on faces, hands, and other delicate portions of the picture, the opaque colors being used only in draperies and the like; but during the 19th c., in which the art has been brought to the highest excellence, the practice has been to execute the entire work, with the exception of the high lights in white drapery, with transparent colors. In working, the general practice is to draw the picture very faintly and delicately with a sable hair-pencil, using a neutral tint

composed of cobalt and burned sienna. The features are carefully made out in that way, and then the carnations, or flesh-tints, composed of pink, madder, and raw sienna, gradually introduced. The drapery and background should be freely washed in, and the whole work is then brought out by hatching, that is, by painting with lines or strokes, which the artist must accommodate to the forms, and which are diminished in size as the work advances. Stippling, or dotting, was a method much employed, particularly in early times; but the latest masters of the art preferred hatching, and there are specimens by old masters, e.g., Perugino, executed in that manner.

MINIÉ, *mīn'ē*, F. *mē-nē-ā'*, CLAUDE ÉTIENNE: soldier 1804, Feb. 12—1879, Dec. 14; b. Paris. He enlisted in the Fr. army 1821; served several campaigns in Algeria; became capt. 1849; was much engaged with study of gun and ammunition improvements, and might have lost his place in the service but for support of the Duke de Montpensier. He was a chief of battalion 1852–57. The M. rifle-ball he invented 1849, but took no patent. It was used by the Eng. army at Inkermann, but not by the Fr. until after the Crimean war. It is a cylinder, conical in front, hollow behind, and with a slight ridge of metal, which pressure of firing forces into the grooves of the gun barrel, causing a flight of the ball of much increased range and precision. Capt. M. came to Amer., 1869, to take charge of the Remington gun factory; but later accepted an appointment to take charge of a school of gunnery and manufactory of arms in Cairo, Egypt.—See RIFLED ARMS.

MINIFIE, WILLIAM: 1805, Aug. 14—1880, Oct. 24; b. Devonshire, England: author. He was educated for an architect; came to the United States and opened an architectural and book-selling establishment in Baltimore 1828; was many years curator of the Maryland Acad. of Sciences, and prof. of drawing in the Maryland Institute Schools of Art; and published *Text-book of Mechanical Drawing* (1849); *Text-book of Geometrical Drawing*; *Perspective and Shadows* (1853); *Essay on the Theory and Application of Color* (1854); and *Popular Lectures on Drawing and Design* (1854).

MINIKIN, n. *mīn'ī-kīn* [Dut. *minnekyn*, a Cupid, dim. of *minne*, love: AS. *minicen*, a nun, a minikin—from *menen*, a damsel]: a favorite; a darling: ADJ. diminutive; small.

MINIM, n. *mīn'īm* [F. *minime*, extremely small—from L. *minimum*, the least: It. *minimo*]: in *music*, a note of the value of half a semibreve: the smallest liquid measure, about equal to one drop. MINIMUM, n. *mīn'ī-mūm*, the least quantity or degree; the opposite of *maximum*; a dwarf. MINIMIZE, v. *mīn'ī-mīz*, to reduce to the smallest quantity or proportion possible. MIN'IMIZING, imp. MIN'IMIZED, pp. *-īzəd*.

MINIMS.

MINIMS, *mĭn'ĩmz* [Lat. *Fratres Minimi*, Least Brethren, so called, in token of still greater humility, by contrast with the *Fratres Minores*, or Lesser Brethren of St. Francis of Assisi (q.v.)]: order of the Rom. Cath. Church, founded about the middle of the 15th c. by another St. Francis, native of Paula, a small town of Calabria. Francis had, as a boy, entered the Franciscan order; but the austerities of that rule failed to satisfy his ardor; and on his return from a pilgrimage to Rome and Assisi, he founded, 1453, an assoc. of Hermits of St. Francis, who lived first in separate cells, but eventually were united in the conventual life 1474, and were established in several places in Calabria and Sicily. Francis was invited into France by Louis XI., and founded houses of his order at Amboise and at Plessis-les-Tours. In Spain, the brethren took the name of 'Fathers of Victory,' in memory of the recovery of Malaga from the Moors, which was ascribed to their prayers. It was not till very near the close of the life of Francis that he drew up the rule of his order. It is exceedingly austere, the brethren being debarred the use not only of meat, but of eggs, butter, cheese, and milk. Notwithstanding its severity, this institute attained considerable success; its houses, soon after the death of Francis (1502), numbering no fewer than 450. It has reckoned several distinguished scholars among its members; but in latter times, the order has fallen into decay, being now limited to a few houses in Italy, the chief of which is at Rome. The superiors of convents in this order are called by the singular name *Corrector*, the general being styled *Generalis Corrector*. A corresponding order of women had its origin about the same time, but also has fallen into disuse.

MINING

MIN'ING: general term for the underground operations by which the various metals and other minerals are procured. It has been practiced to some extent from remotest times, as is proved by the reference to it Job xxviii. (see especially the Canterbury revision). In its proper sense, the art was certainly known to the ancient Phœnicians and Egyptians, also to the Greeks and Romans. M. was carried on in Britain by the Romans at the time of the Roman Conquest. After the Norman Conquest, Jews, and, later, Germans were largely employed in British mines. The introduction of gunpowder as a blasting material 1620, brought many improvements in M.; so also did the introduction of powerful engines for pumping water, about the beginning of the 18th century.

There are two principal methods of M.: one of which is adopted where the mineral occurs in veins or lodes, as copper and lead ore; and the other where the mineral occurs in more or less parallel beds, as coal. M. in alluvial deposits is a third method, largely practiced in the gold regions of California and Australia, and includes the novel process of 'hydraulic mining.'

In mines like those of Cornwall and Devonshire, England, where most of the copper and tin of Great Britain, and also some of the lead, are obtained, the ores occur in veins filling cracks or fissures in the rocks. Such veins are termed lodes, to distinguish them from veins of quartz and other non-metallic minerals. Lodes are very irregular in size, and in the directions they take, though they usually follow one general line.

Fig. 1 shows a portion of a lode, where *a* represents the main or 'champion' lode, and *b* the branches, called

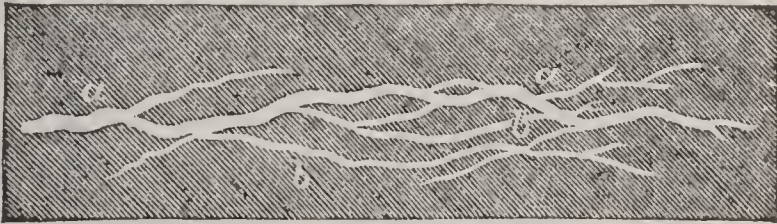


Fig. 1.—Portion of a Lode or Mineral Vein.

feeders, shoots, and strings. Mineral veins sometimes extend several miles through a country; but they expand and contract so much, and split up into so many branches, that it is perhaps uncertain whether the same lode has ever been traced for more than a mile. Veins seldom deviate more than 45 degrees from a perpendicular line, and descend to unknown depths. They penetrate alike stratified and unstratified rocks. Those veins which run e. and w. have been observed to be most productive.

Fig. 2 shows a section of a Cornish mine across the lodes, *l, l, l, l*; *a* is the engine-shaft, in which are the pumps and the ladders for ascent and descent; *b, b* are *whim-shafts* for raising the ore, which is done by means of buckets. The adit, or day-level, is a long passage to which the water of the mine is pumped up and conveyed

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away. Some adits are made to traverse several mines. The great adit which drains the mines of Glennap and

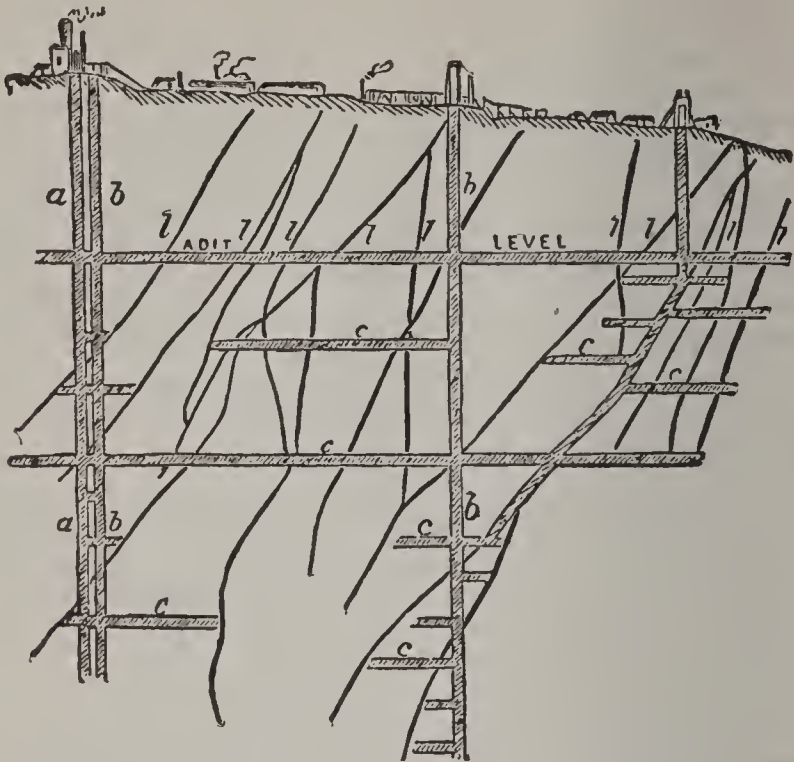


Fig. 2.—Cross-section of a Cornish Mine.

Redruth, in Cornwall, is 30 m. long. At *c, c, c*, are cross cuts, by which the workings on the different lodes are connected.

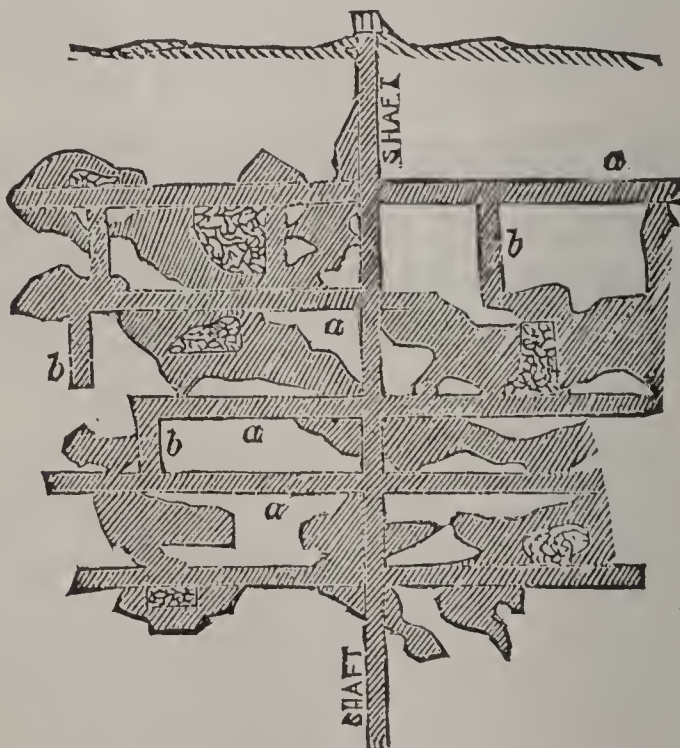


Fig. 3.

Fig. 3 is a partial section in the direction of a lode, and therefore at right angles to fig. 2. It shows the horizontal galleries, termed *levels*, *a*, which are driven upon the lode, and some of the small upright shafts, called

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winces, b. Levels are generally about ten fathoms (60 ft.) apart. They are rarely perpendicular above each other, as they follow the inclination of the vein. In the section, the richer portions of the lode, termed 'bunches,' are shown shaded; and where these have been removed, and their place filled with rubbish, angular fragments are represented. This is necessary to prevent the sides of workings from falling in. The bottom of the engine-shaft is the lowest portion of the mine. It is called the *sump*, and is the place where the water from the various levels and workings collects, in order to be pumped up to the adit. The galleries and shafts in an extensive mine are very numerous, making it altogether a very complicated affair. The shafts, however, all have distinct names, and the levels are known by their depth in fathoms, so that particular places are as easily found as streets in a town. The underground workings of the Consolidated Mines, the largest in Cornwall, being a conjunction of four mines, are 55,000 fathoms, or 63 m., in extent. In working out the lode between one level and another, the miner usually goes upward, it being easier to throw down the ore than to raise it up. He works with the light of a candle, stuck with clay to the side of the mine. His tools are few—namely, a pick, a hammer, and some wedges where the vein is soft and friable; but it is generally hard enough to require blasting, in which case he uses a *borer* or *jumper*, and some smaller tools for cleaning and stemming the hole which is made. The ore is filled into wagons, and then drawn along the gallery to the shaft, to be raised to the surface in *kibbles*.

A vein may be 30 or 40 ft. thick, and so poor in ore as not to be worth working; again, it may be only a few inches thick, and yet its richness may amply repay the labor of extracting it. Three or four feet may be taken as the average of several kinds of veins. In extensive mines, portions of the ore are here and there left in the lode, so as to furnish a steady supply when other parts are unproductive. These are called *eyes*, and when they are afterward removed, the operation is termed *picking out the eyes of the mine*.

The old plan of ascending and descending the mines by ladders, so destructive to the health of the miners, is still largely in use. The ladders are now about 25 ft. long, and set with a slope. There is a platform at the bottom of each called a *sollar*, with a man-hole in it leading to the next ladder beneath. Some of the Cornish mines are half a mile deep, so that it takes the miner an hour to reach the surface after he is done with his work; most of the journey being accomplished on wet, slippery ladders. The bad effects of the fatigue so produced is augmented by the fact that the men come from a constant temperature of 80° or 90° F. below, to one of perhaps 30° or 40° on the surface. Dr. J. B. Sanderson states as the result of recent inquiries, that 90° F. is the highest limit of temperature consistent with healthful labor in a mine.

A great improvement on the ladder system is now in operation in several deep Cornish mines. It is a method first introduced into the deep mines of the Harz, Germany, and called the *Fahr-kunst*. The plan of this 'man-engine' is this. Two rods descend through the depth of the shaft, and upon these bracket-steps are fixed every 12 ft. The rods move up and down alternately through this distance by means of a reciprocating motion. Fig. 4 represents the arrangement when the rods are at rest. If the miner wishes to ascend, he places himself on the step *a* of the rod A, and is raised by the first movement of this rod to the level of *b'* on the rod B (see fig. 5), to

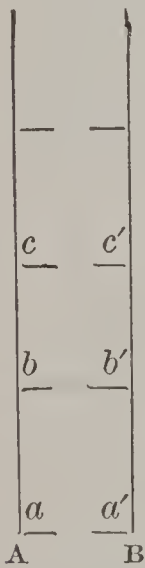


Fig. 4.

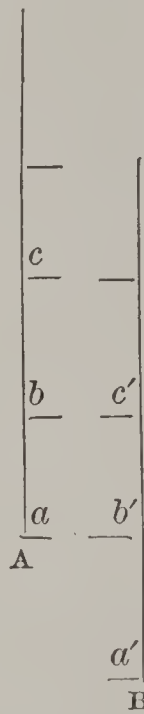


Fig. 5.

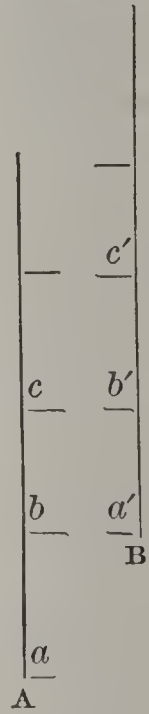


Fig. 6.

Diagrams to illustrate 'Man-engine.'

which he now crosses. The next movement raises the rod B, and brings the step *b'* up to the level of *c* on A (fig. 6), to which he next crosses; and so, ascending stage by stage, he reaches the top. The descent is, of course, accomplished in the same manner.

Some of the Cornish pumping-engines are very large and powerful. The cylinder of one of the largest is 7 ft. 6 inches in diameter. With the expenditure of one bushel of coal, it can raise 100,000,000 lbs. weight one foot high; this is called its 'duty.' It lifts nearly 800 gallons of water per minute, and its cost was about £8,000.

In Cornwall, the miners are divided into two classes: one called *tributers*, who take a two months' contract of a portion of the lode; the other called *tutmen*, who are employed in sinking shafts, driving levels, etc.

A detailed analysis of one of the largest Cornish copper mines, published some years ago, shows that in that year it produced, in round numbers, 16,000 tons of ore, realizing £90,000, and yielding a net profit of about

£16,000. It employed about 700 miners, 300 laborers, 300 boys, and 300 women and girls. The cost for coal was £1,800; for malleable iron and steel, £1,300; for foundry castings, £2,000; for ropes, £1,000; for candles, £1,800; for gunpowder, £2,000; and for timber, nearly £3,000. See MINES in Law.

Mining for Coal.—The minerals of the carboniferous formation, at least those which occur in beds or strata, as coal and clay ironstone; are mined in a different way from metallic veins. Originally deposited in a horizontal position, they have been so altered by movements in the earth's crust, that they are rarely found so now. They are found usually lying in a kind of basin or trough, with many minor undulations and dislocations. But however much twisted out of their original position, the different seams, more or less, preserve their parallelism, a fact of great service to the miner, since beds of shale, or other minerals, of a known distance from a coal-seam, are often exposed when the coal itself is not, and so indicate where it may be found.

The great progress made of late years in the science of geology has brought such minute acquaintance with all the rock formations above and below the coal-measures, that it is now comparatively easy to determine whether, in any given spot, coal may or may not be found. Nevertheless, large sums are still occasionally, as they have in past times been frequently, wasted in fruitless search for coal, where the character of the rocks indicates formations far removed from coal-bearing strata.

When there are good grounds for supposing that coal is likely to be found in any particular locality, before a pit is sunk, the preliminary process of 'Boring' (q.v.) is resorted to, in order to determine whether it actually is there, and whether in quantity sufficient to make the mining of it profitable. The usual mode of 'winning' or reaching the coal is to sink a perpendicular shaft as at *a*, fig. 7; but sometimes a level or cross-cut mine, *b*, and at other times, an inclined plane or 'dook' *c*, is adopted.

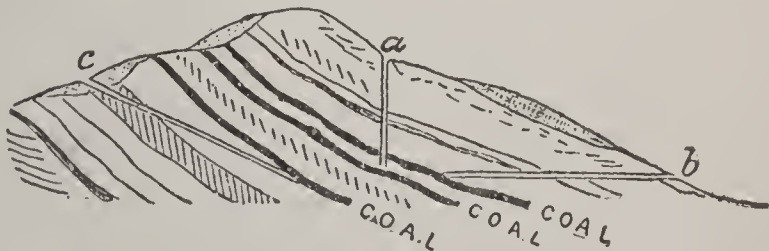


Fig. 7.—Diagram showing Methods of 'Winning' the Coal.

Before the introduction of pumping-engines, all coal-workings were drained by means of a level mine (*b*) called a *day-level*, driven from the lowest available point on the surface, and no coal could be wrought at a lower depth than this, because there were no means of removing the water.

When the shaft has been sunk to the necessary depth, a level passage, called the *dip-head*, or *main-level*, is first driven on each side, which acts as a roadway or passage, and, at the same time, as a drain to conduct the water, which accumulates in the workings, by means of a gutter on one side, to the lodgement at the bottom of the shaft. This level is the lowest limit of the workings in the direction of the dip, and from it the coal is worked out as far as is practicable along the rise of the strata. There are two principal methods of mining the coal. One is termed the 'post-and-stall' or 'stoop-and-room' system, and is used for thick seams; the other is called the 'long-wall' system, and is adopted for seams under four feet in thickness. Fig. 8 represents a portion of a mine wrought on the post-and-stall plan, where the coal is taken out in parallel spaces of say 15 ft. wide, intersected by a similar series of passages at right angles. Between these 'rooms,' as they are called, 'stoops' of coal, about 30 ft. each way, are left for the support of the 'roof' of the seam. Larger stoops are left at the bot-

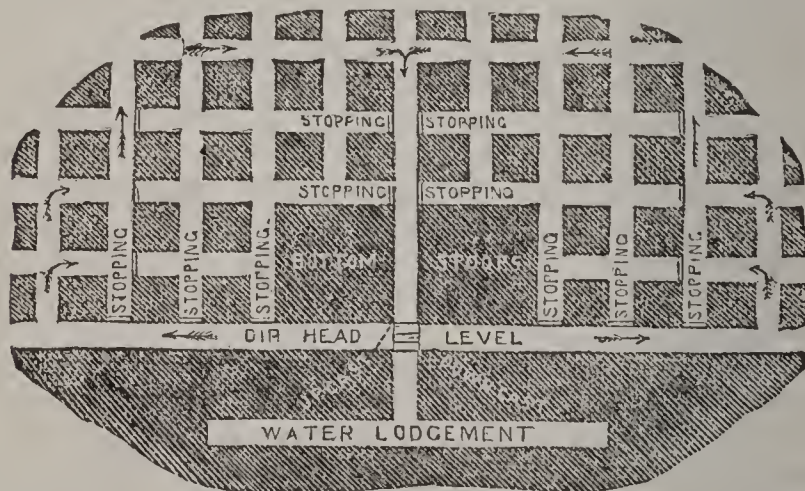


Fig. 8.—Plan of Part of a Coal Mine, showing 'Stoop-and-Room' Workings.

tom of the shaft, in, order to secure greater stability there. There is a modification of this plan adopted at Newcastle, called the 'board-and-pillar' method, by which a certain number of the stoops or pillars are removed altogether, after which the roof falls in, and forms a mass of ruins, termed a 'goaf.'

The *long-wall* system consists in extracting the entire seam of coal at the first working, the overlying strata being supported by the waste rock from the roof of the workings. It is necessary, however, to leave large stoops at the bottom of the shaft for its support, as in the stoop-and-room method. In long-wall workings, roads of proper height and width require to be made for communication with the different parts of the mine.

The collier's usual mode of extracting the coal from its bed is this: With a light pick, he undercuts the coal-seam, technically termed 'holing,' for two or three ft. inward, and then, by driving in wedges at the top of the seam, he breaks away the portion which has been

holed. Blasting is another method. In recent years, machines, some for 'holing' only, and others for both 'holing' and hewing down coal-seams, have been in use. They work usually with compressed air, but sometimes with steam or water. The coal, when separated from its bed, is put on tubs or hutches, drawn generally by horses, but sometimes by engine-power, along the roads to the bottom of the shaft, and hoisted to the surface.

The shaft is perhaps the most important portion of a coal-pit, and the principal parts of one are shown in fig. 9. The upper part shows the pit-head arrangements, the central part shows the foree-pump, etc., and the lower part shows the pit-bottom arrangements. To make the section complete, the reader must imagine a great depth to intervene at the gaps A and B. There are four divisions in this shaft: the two centre ones, *a, a*, are used for sending up and down the men and the coal; the one on the right side, *b*, contains the pumps; and the remaining one on the left, *c*, is for withdrawing the vitiated air from the mine, and has usually a furnace at the bottom of it. In some pits a special shaft is applied to the ventilation, for which mechanical contrivances, such as ventilating fans, are now also partially introduced. Since the dreadful accident at the Hartley Colliery, England, 1862, Jan., caused by the beam of the engine breaking and closing up the shaft, an act of parliament has been passed making it imperative to have two shafts, or at least two outlets, to every coal-mine, as a means of escape, in case of an accident to one of them.

The cages *d, d*, by which the colliers ascend and descend, are used also for raising the coal. They are merely square plats of timber, with rails across them, for the convenience of running off and on the coal-hutches, *e*, and with a light iron frame, by which they are suspended to a flat wire-rope. On each cage there are iron elapsps, which slide up and down on guide-rods. In the figure, two miners are shown standing on one cage at the bottom of the shaft, and the other cage is at the top, with a coal-hutch upon it. The accidents resulting from the raising and lowering of the cages are numerous; many of them happen by the carelessness of the engine-man in not stopping the cage when it reaches the mouth of the pit, and so allowing it to be upset by over-winding. Many accidents also happen from the rope breaking. To prevent this, numerous 'safety-cages' have been invented, most of which depend on the action of a spring, which is held in a certain position while the cage is suspended by the rope; but should the latter snap, the spring is suddenly relieved, and then grasping the guide-rods, prevents the cage from falling. Other safety-cages act by levers and clutches, but it is still disputed whether there is, on the whole, a decided advantage in using any of them, since they all are liable to become out of order. The man-engine shown in figs. 4, 5, and 6, though not used in British collieries, is adopted in several on the

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European continent, and is certainly the safest way of putting up and down men in a pit.

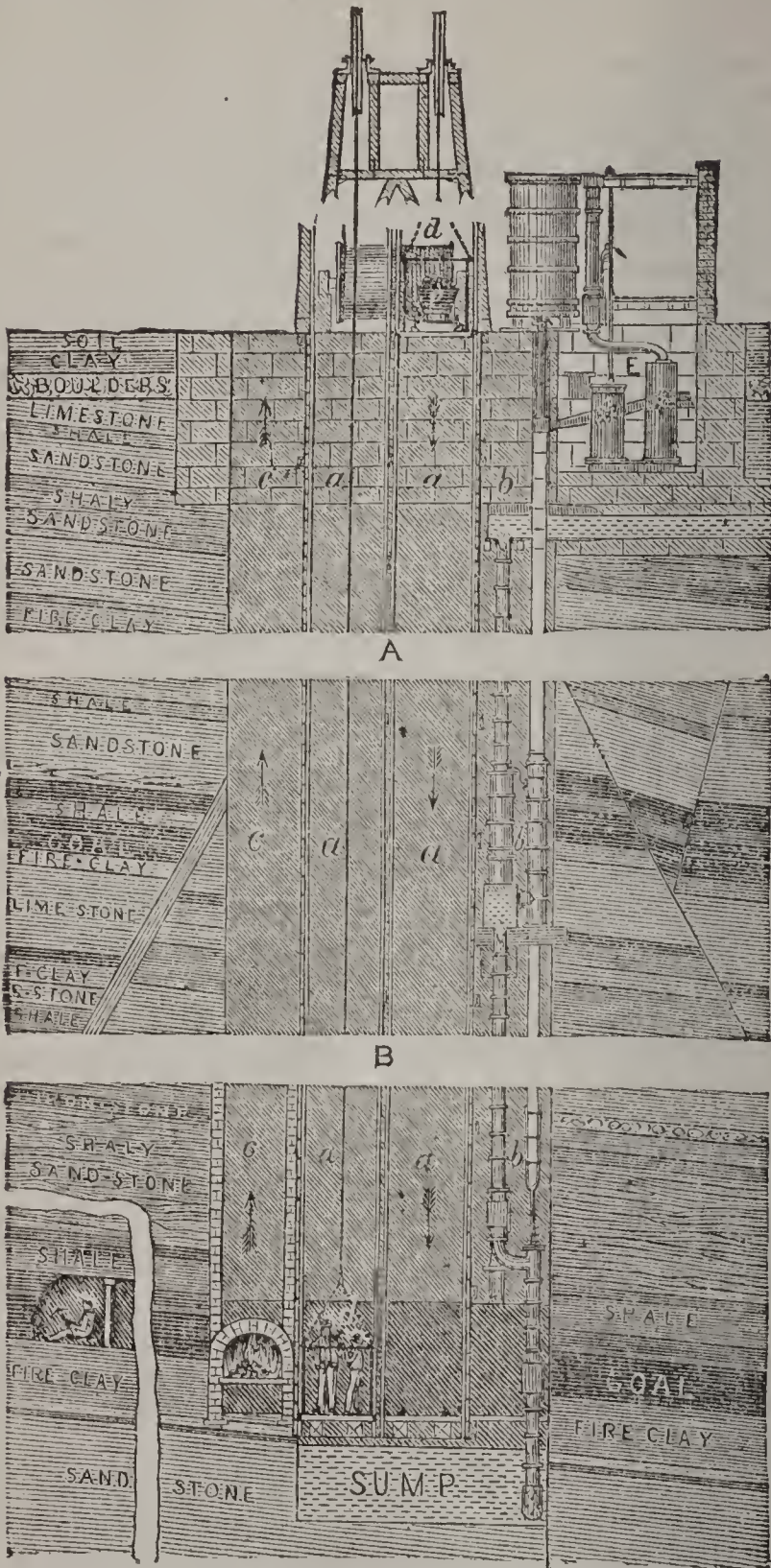


Fig. 9.—Vertical Section of the Shaft of a Coal-pit, with a Detached Portion, showing a Miner at work on the Coal Seam.

The steam-engine, E, works the pumps, in this case by a direct action, the pump-rods being attached to the piston-rod. The engine also winds up the cages, one of which ascends while the other descends—the barrel and other arrangements for which are shown in the figure.

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The proper ventilation of any mine, but especially of a coal-mine, is of very great importance. It clears the mine of the dangerous gases, fire-damp and foul-damp, dries the subterranean roadways, and furnishes the miners with a supply of pure air. Some idea of the general mode of ventilating a mine will be obtained by referring to fig. 9, where the arrows pointing downward indicate the *downcast* shaft, and the arrows pointing upward, the *upcast* one; and to the plan, fig. 8, where the atmospheric air, entering by the downcast shaft, passes along the roadways, as indicated by arrows. A number of doors and stops secure the travelling of the current in a proper direction, so as to reach the farthest recesses of the mine. It then returns by the upcast shaft, where, as has been already stated, it is usual to keep a furnace burning, to aid in withdrawing the impure air. It is very difficult, however, to secure efficient ventilation through all the zigzag windings of a mine; hence the frequent, and sometimes terrible, explosions of fire-damp, or light carburetted hydrogen, which explodes when mixed with a certain proportion of atmospheric air; hence, also, the occasional accumulation of foul-damp (carbonic acid) in some pits, which suffocates any one breathing it. This deadly gas is always produced in large quantity by an explosion of fire-damp, and chokes many who have survived the violence of the explosion. See SAFETY LAMP. Of late it has been found that the presence of *coal-dust* in a mine renders the air explosive if 2 per cent. of fire-damp also is present.

Besides the above-mentioned sources of accident, there is the sudden falling-in of pieces from the roof of the workings. The following summary, made up from the British govt. inspector's returns, shows the number of lives lost, in proportion to the quantity of coal raised:

Total tons of mineral raised in Great Britain in 1879.....	145,366,369
Total number of lives lost in 1879.....	973
Average tons of mineral raised to each life lost.....	149,400

The magnitude of some of the large coal-mines, is indicated by the fact that the Hetton Colliery, in Durham, England, yields 800,000 tons in the year, employs about 1,000 men and 300 boys underground, and 300 people at the surface. The Monkwearmouth pit, near Newcastle, is 1,900 ft. deep, and its face-workings are two miles from the bottom of the shaft. Rosebridge Colliery, near Wigan, has the deepest shaft in England, nearly 2,500 ft. The sinking of some of the more difficult shafts has cost from £50,000 to £100,000 each.

In the United States, M. has contributed enormously to the settlement, growth, and wealth of the country. The gold, silver, lead, copper, and quicksilver of the s.w. states; the copper and iron of Mich.; the coal and iron of the great field represented by Penn.; and other mining products widely distributed, have incalculably promoted Amer. prosperity.

In gold M. California stands unmatched since the

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discovery of 1848. The gold is found in alluvial deposits, or placers, in the form of dust, scales, grains, or nuggets, and in lodes or veins of quartz rock. The early M. was by washing the gold-bearing placer deposit, but this was superseded by a more effective method of hydraulic washing, and by mills for crushing the gold-bearing quartz, and extracting the gold by a process of amalgamation. The erection of mills began 1851, and 20 years later there were more than 400, distributed widely over the state. The Cal. mines yielded, 1848-82, a grand total estimated \$1,154,689,039. Ores of silver abound, some of them very rich, and mills for crushing the quartz were in operation as early as 1870, but not comparing in extent with the production of gold. The second mining interest of Cal., and one very largely developed, is the production of quicksilver. It is equalled in this by no state of the union. The oldest and largest mine is the New Almaden, in Santa Clara co. Besides the New Almaden, the chief quicksilver mines are the Great Western, Napa Consolidated, and Redington. The yield of the state (1880-84) was 252,147 flasks.

M. in Nevada dates from the discovery of silver, 1859. Gold was found 1849. The two commonly occur together, but the silver, found in all parts of the state, has given the largest return. In the Comstock lode, the richest silver deposit in Amer., until its exhaustion, the ores gave more silver than gold. In the years 1861-74 the gold product of Nev. amounted to \$63,230,000, and the silver to \$181,350,000. Of the aggregate, for the 14 years, of \$244,580,000, the separate yield of the Comstock lode was \$169,000,000. The bullion output (1875) was \$40,478,369; (1876) \$49,280,764; (1877) \$51,580,290. This was for each of these years more than half the yield of the United States. The two most productive mines of Nev., the California and the Consolidated Virginia, both on the same vein of the Comstock lode, measuring less than 800 ft. in length by 60 to 300 ft. wide, reached in 1878 a total output of \$100,000,000. From 1867 to 72 a company sank in working the spot \$161,340, without any return; and its successor had sunk \$277,150, without realizing anything; when, the 108,000 shares of each co. being worth but \$2 a share, the working cut into a bonanza, in the autumn of 1874, richer than anything ever before found in a mine. In less than five years the output was \$100,000,000. Of this about 45 per cent. was gold and 55 silver; and the profits amounted to \$69,140,000. But the greater depth to which the work was now carried caused great decrease in 1879 and subsequent years; and these mines paid no more dividends after the profits had reached \$74,250,000. In 1885 the ore raised hardly paid the cost of extraction and reduction, and the Comstock deep mining was abandoned. The depression thus caused was relieved somewhat by new discoveries at higher levels and in other parts of the state. The bullion output of Nev. (1886) was \$9,169,920; (1887) \$10,232,453; (1888) \$12,305,603; (1893) \$2,977,151; (1894) \$2,476,196.

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M. has been the chief industry of Montana since 1861, following the discovery of gold 1852. Gold is obtained from both placer diggings and quartz mines, in an amount second only to the yield of Cal. As M. has grown in Mont., it has included a vast production of silver, with some copper and lead. The quartz lodes of gold, silver, and copper, are found in almost every co., but of excessive richness and development of M. in Silver Bow co., about Butte City. The gold yield 1862-76 was \$144,400,000. The estimate for the gold, silver, copper, and lead of 1884 was \$30,000,000. This included 20,000,000 lbs. of copper from the mines at Butte City. The largest smelting-works for the reduction of copper anywhere found in the west were completed this year. But low prices for silver and copper, from 1885, somewhat checked M. in Mont., as elsewhere. The yield, however, reached (1886) gold \$3,450,000; silver \$9,600,000; copper \$8,000,000; lead \$1,250,000; total \$22,300,000. In 1890 the yield was: gold \$3,300,000, silver \$20,363,636; (1891) gold \$2,890,000, silver \$21,139,394; (1892) gold \$2,891,386, silver \$22,432,323; (1893) gold \$3,576,000, silver \$21,858,780; (1894) gold \$3,651,410, silver \$16,575,458.

Colorado abounds especially in gold, silver, and lead. Gold has, since 1872, fallen far behind silver, in value of output. The early working of placers, for gold only, was largely given up by 1874, when the carbonates, which had been thrown aside as refuse, were found to be very rich in silver; and silver production had by 1880 become more than five-fold that of gold, while lead also reached an enormous development. M. for gold began 1859, and to 1872, June, the output had exceeded \$60,000,000. Silver was discovered as early, but M. to develop the chief lodes dates from 1867, and the yield, 1868-72, was \$1,113,580. In 1878 the gold and silver output was estimated at \$10,000,000, placing Colo. next after Nev. and Cal., with a total yield of gold and silver, 1859-78, of more than \$74,000,000; gold, \$25,811,759; silver, \$48,217,469. In 1890 the production was: gold \$4,150,000, silver \$24,307,070; (1892) gold \$5,300,000, silver \$31,030,303; (1894) gold \$9,491,514, silver \$30,101,203. In 1890 far the largest production of precious metals was from the Leadville district. But since that time the developments at Cripple Creek promise to make that district a rival. Pitkin co. stood second (1890), with output \$7,362,422 bullion value. Other products of Colo. (1890) were: copper 1,170,033 lbs., lead 70,788 tons, \$2,101,014 value; coal, bituminous, 2,544,144 tons.

Arizona abounds in lodes of gold, silver, copper, and lead, and with a beginning of M. (1868), the yield of gold and silver became (1879) \$1,942,403; (1880) \$4,472,471; (1881) \$8,198,766; (1882) \$9,298,267; (1885) \$3,800,000; (1890) \$1,292,929; (1892) \$1,373,375; (1894) \$1,483,254. There was turned out also, at this time, copper (1880) 2,000,000 lbs.; (1881) 5,000,000 lbs.; (1882) 15,000,000 lbs.; (1889) 31,586,185 lbs.

In Utah M. became a great interest after the Pacific r.r. opened a market. The output of 16 years, 1871-87 was,

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silver, \$73,201,966; lead, \$33,799,599; gold, \$3,065,692; copper, \$3,003,889; total, \$113,071,147. Silver production (1890) \$10,343,434; (1892) \$10,472,727; (1893) \$9,304,307; (1894) \$7,617,812.

M. in Mich. depends chiefly on valuable iron ores, and on the deposits of native copper. The total yield of copper M., 1845-77, was 289,188 tons, value \$116,928,280; yield (1880) 31,500 tons; (1881) 34,102 tons. The eight chief mines had turned out (from their opening, to 1881) 226,559 tons, valued at nearly \$91,000,000. The Mich. iron mines draw from the immense deposits of specular ore of the Marquette region s. of Lake Superior, and furnish a large proportion of the Bessemer pig iron of the United States. The product, 1856-82, was 20,584,931 tons, value \$164,830,526; (1888) 3,934,339 tons. The salt mines of Mich. are of great importance. The whole yield of the state to 1877 was 11,960,938 barrels.

Penn. ranks in M., limited to coal, iron, and petroleum, first of the states of the union. It has the best part of the Alleghany coal field, 58,737 sq. m., extending from n. Penn. over parts of O., Va., W. Va., Ky., Tenn., and Ga., to the middle of Ala. The e. central Penn. mines, in basins occupying only 470 sq. m., supply almost all the anthracite coal used in the United States. Next w. of the anthracite basins the mines yield semi-bituminous coal, and farther w. the common bituminous. M. in Penn. is carried on over 12,774 sq. m., yielding not only the anthracite supply of the United States, but also more bituminous coal than any other state. The iron-ore mines of Penn. produced (1880) 2,173,415 tons out of a total yield in the United States of 8,022,398. The petroleum or rock-oil product of Penn. dates from 1859, Aug. 26, when a well was opened which yielded 1,000 gals. a day. Before the close of 1860, wells to the number of 2,000 had been sunk, and 74 of these were yielding 44,600 gals. daily. The oil is found in zones at different depths varying from 60 to more than 1,000 ft., and in the Penn. field entirely unconnected with the coal field. The product 1860-73 was 55,461,869 barrels, an average of 10,852 barrels daily. A succession of fields have been wrought and exhausted.

Ohio M. is mostly confined to its coal field of 10,000 sq. m. There were (1876) 275 mines yielding 3,000,000 tons of coal; 618 mines were reported 1880, with yield more than 6,000,000 tons. The value of the Ohio output 1880 was nearly \$8,000,000. The gain in 1887 placed the state above Ill., second only to Penn. as a coal-producing state. Though using chiefly for iron manufactures the Lake Superior ores, O. bases her rank as the second iron-producing state of the union partly on the mines of the Hanging Rock region, in Jackson, Lawrence, and Scioto cos., and the blackband ore mines of Stark and Tuscarawas counties.

Virginia, with great wealth of minerals—iron ore of the best quality, copper ores in the Blue Ridge Mts. as abundant as those of Spain, lead in the great valley, and

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an extensive share in the vast Alleghany coal field, yet counts for little now in M., from lack of development.

W. Va. is almost wholly underlaid with bituminous coal, and from 118 mines produced (1883) 2,805,566 tons of coal. The production (1886) of 112 mines was 3,213,093 tons; (1892) 5,274,000 tons; (1895) 11,000,000 tons.

In Md. M. deals with iron, coal, and copper. Eighty mines were in operation (1870), with capital \$25,369,730, and products for the year of value \$3,444,183. Of the mines 43 were of iron ore, 22 of bituminous coal, and 2 of copper. The Cumberland semi-bituminous mines, on a rich bed 14 ft. thick, w. of Cumberland to Piedmont, supply coal of special value for steam purposes. The output (1873) was 2,674,110 tons; total (1842-73) 24,027,786 tons. The yield 1895 was 3,772,386 tons.

In Ky. M. for coal showed an output (1887) 44,830,000 bush. The available Ky. coal-measures underlie nearly 13,000 sq. m., and the greatest wealth of iron ores of the best quality insures a vast growth of M.

In Tenn. 39 coal mines were in operation 1889; yield (1890) 2,169,585 tons; (1895) 2,300,000 tons. Of four iron belts which cross Tenn., three have been worked, and M. recently has developed rapidly. In the s.e. corner of the state two extensive companies have mined rich copper deposits which cover 40 sq. m. The larger of these produced (1865-74) 8,476,872 lbs. of ingot copper.

In Ala. M. for coal and iron occurs in the n.e. section. The output of coal amounted (1895) to not far from 5,700,000 tons. The M. of iron has equally advanced, and upon M. the new prosperity of the state chiefly rests.

M. in Ind. for coal extends over a field of 7,000 sq. m.; and 50 Ind. mines (1873) were producing 5,000 tons daily. The mines of all kinds (1880) numbered 177; yielding for the year 1,196,490 tons of coal. The yield 1881 was 2,128,977 tons. In 1889 the mining companies numbered 350, production 2,845,057 tons, value \$2,887,852. Production (1894) 3,423,921, (1895) 3,000,000.

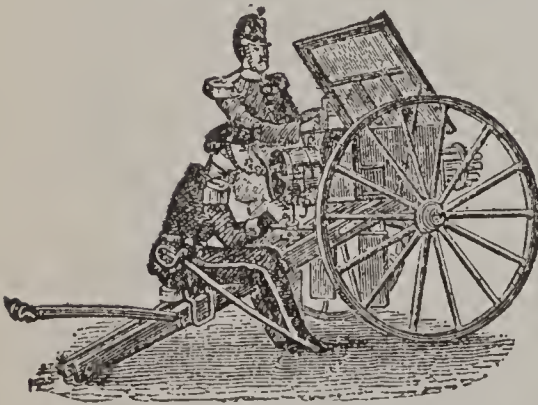
M. in Ill. is developed over more than 30,000 sq. m. The mines numbered (1887) 817; value of output \$11,152,596. Iron in Ill. is of slight value, but lead mines of great value have been worked, where the great western lead-bearing belt enters the n.w. corner of the state. These mines have declined in importance since 1845. Wisconsin has had similar lead mines, with remarkable development 1826-45, followed by decline. The iron, copper, and zinc of Wis. have not been mined. In Iowa the lead mines, on a tract of 12 or 15 sq. m. near Dubuque, have given a richer yield than any others in the Mississippi valley, but the coal output from more than 3,000 sq. m. of coal-fields in w. Io. represents more permanent wealth. Total yield (1892) 5,918,491, (1895) 3,500,000. In Mo. M. for coal extends over about 23,100 sq. m. The number of mines (1890) was 122, output 2,557,823 tons; value \$3,479,057. The iron mines of Mo. draw from deposits of specular iron ore, chiefly at Iron Mt. and Pilot Knob, the amount of which is beyond calculation, and



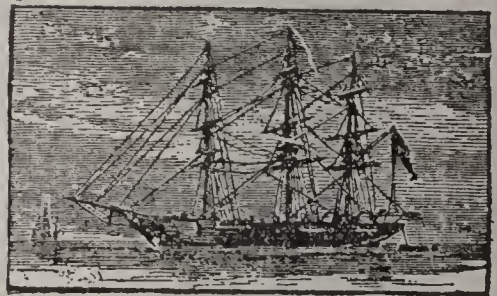
Mitre Shell.



Mink.



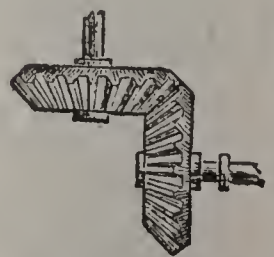
Mitrailleuse.



Mizzen.



1, Mitre of Jewish High Priest; 2, Mitre of English Bishop; 3, Mitre of English Archbishop



Mitre-wheels.

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the quality most adapted to the iron industry of the whole country. The output (1890) was 864,504 tons of ore. Lead, copper, and zinc also are mined in Mo. In Kansas M. for coal extends over the e. part, 17,000 sq. m., but not largely developed. The output (1890) 2,259,922 tons; (1892) 3,007,262; (1895) 3,300,000. Iron ores in Kan. do not pay to mine. Arkansas promises to develop M. largely in coal, iron, zinc, and lead, with a little silver. The coal-fields cover 12,000 sq. m., of deposits of anthracite, cannel, and bituminous coal, more in amount than all the coal of Great Britain. Iron ores equalling those of Mo., lead of extreme richness and vast amount, with zinc ore second only to that of N. J., afford the basis of M. yet to be developed. Dakota began quartz M. for gold, in the Black Hills region, 1877, with product \$1,500,000. The placer mines yielded \$1,000,000, and had given more than that in 1876. Silver also was found, and the gold and silver output to 1887 was \$33,700,000, with but very partial development. Mines of tin, copper, and mica are of great promise.

MINION, n. *mĭn'yŭn* [F. *mignon*; It. *mignone*, a darling, a favorite: Dut. *minnen*, to love: comp. Gael. *min*, soft, gentle]: a favorite, particularly of a prince; a low or unprincipled dependant or flatterer; among *printers*, a letter of a particular size. MINION-LIKE, daintily.

MINISH, v. *mĭn'ĭsh* [F. *menuiser*, to minish, to extenuate—from mid. L. *minutārĕ*, to reduce to fragments—from *minŭtus*, small]: another and now obsolete spelling of DIMINISH, which see.

MINISTER.

MIN'ISTER, n. *mĭn'is-tĕr* [F. *ministre*—from L. *minister*, an attendant, a servant—from *minus*, less: opposed to *magister*, the person in superior place—from *magis*, more]: pastor of a church; a clergyman (see CLERGY): in the governmental administration of a country, the head of a department of government appointed by the chief executive or by the sovereign (see MINISTRY, in Executive Government); in diplomatic affairs, the representative of a national government or of a sovereign at a foreign state, but (in the strict use of the term though not always in popular use) without the dignity of an Ambassador (q.v.—see also MINISTER, in Diplomacy); V. to give aid or relief, as to the sick or poor; to perform, as the duties of an office. MIN'ISTERING, imp. *-ĭs-trĭng*: ADJ. attending and serving; affording aid or things needful. MIN'ISTERED, pp. *-tĕrd*. MINISTRATION, n. *mĭn'is-trā'shŭn*, the office of a minister, or the service performed by him; agency. MIN'ISTRATIVE, a. *-tĭv*, affording service; assisting. MIN'ISTERIAL, a. *-tĕr'i-āl*, pertaining to ministers of religion, or to the chief servants of a state or sovereign; official; executive; attendant. MIN'ISTERIALIST, n. *-āl-ĭst*, in *politics*, a supporter of the ministry holding office. MIN'ISTERIALLY, ad. *-lĭ*, in a ministerial manner; after the manner of the executive; officially. MIN'ISTRANT, a. *-trānt*, performing service as a minister; attendant on service. MINISTRY, n. *mĭn'is-trĭ* [L. *ministĕrĭŭm*, service, attendance]: agency or service of a minister of religion; the office, duties, or functions of the chief ministers of a state or sovereign; the period of duration of such official function; the body of ministers of a state; the clergy collectively (see CLERGY): agency; interposition; employment. PRIME MINISTER, in Great Britain, the first lord of the treasury, and head of the British government, who appoints his colleagues. CABINET MINISTERS, or executive government, in Great Britain (see MINISTRY, in Executive Government).—SYN. of 'minister, n.': priest; parson; official; ambassador; delegate;—of 'minister, v.': to serve; attend; wait upon; officiate; administer; contribute;—of 'ministerial': ecclesiastical; clerical; sacerdotal; priestly.

MIN'ISTER, in Diplomacy: delegate or representative of a national government or of a sovereign at a foreign court to treat of affairs of state. Every independent state has a right to send public ministers to, and receive them from, any other sovereign state with which it desires to be in amity. Semi-sovereign states have generally been considered not to possess the *jus legationis*, unless when delegated to them by the state on which they are dependent. The right of confederated states to send public ministers to each other, or to foreign states, depends on the nature and constitution of the union by which they are bound together. The constitution of the United Provinces of the Low Countries and of the old German Empire preserved this right to the individual states or princes, as do the present constitutions of the

German Empire and Swiss Confederation. The constitution of the United States either greatly modifies or entirely takes away the *jus legationis* of each individual state. Every sovereign state has a right to receive public ministers from other powers, unless where obligations to the contrary have been entered into by treaty. Diplomatic usage recognizes three orders of ministers. Ministers of the first order possess the representative character in the highest degree, representing the state or sovereign sending them not only in the particular affairs with which they are charged, but in other matters: they may claim the same honors as would belong to their constituent, if present. This first class of diplomatic agents includes papal legates and nuncios, and ambassadors ordinary and extraordinary. A principle of reciprocity is recognized in the class of diplomatic agents sent. States possessing the honors of royalty send to each other ministers of the first class; so in some cases do those states also which have not such honors; but it is said by some writers on international relations that no state having such honors can receive ministers of the first class from states not possessed of them. For the states that are held to possess royal honors, see DIPLOMACY.

Ministers of the second and third order have not the same strictly representative character; their representation is held not to go beyond the affairs with which they are charged. They are, however, the natural protectors of the subjects of the state or country sending them in the country to which they are sent. Ministers of the second class include envoys, whether these are simply so styled, or denominated envoys extraordinary, also ministers plenipotentiary. The third class of ministers does not differ from the second in the degree of their representative character, but only in the diversity of their dignity, and the ceremonial with which they are received. This class comprehends ministers, ministers resident, ministers chargés d'affaires, such consuls as are possessed of a diplomatic character, and those chargés d'affaires who are sent to courts to which it is not wished to send agents with the title of minister. Ministers of the third class have, for the most part, no letters-credential from the chief executive or the sovereign, and are accredited only by letters to the foreign minister or secretary of the country to which they are sent.

Besides these orders of ministers, other diplomatic agents are occasionally employed—e.g., deputies sent to a congress or confederacy of states, and commissioners to settle territorial limits or disputes concerning national jurisdiction. These are generally considered to possess the privileges of ministers of the second and third order. Ministers-mediators are ministers sent by two powers, between which a dispute has arisen, to a foreign court, or congress, where a third power, or several powers, have, with the consent of the two powers at variance, offered to mediate between them.

Diplomatic ministers, except, as above mentioned, those of the third class, are accredited by a letter to the chief executive or the sovereign of the country to which they are sent. The letter of credence is usually dispatched under a *cachet volant*—i.e., a seal which does not close the letter; or else, in addition to the principal letter, an authenticated copy is sent, which the diplomatic minister on his arrival presents to the minister or secretary of foreign affairs, as the warrant for his right to demand audience of the personal head of the govt. or the sovereign; the original is presented to the personal head of the govt. or the sovereign. Ministers sent to an international congress or diet have usually no credentials, but merely a full power, of which an authenticated copy is delivered into the hands of a directing minister, or minister-mediator. A minister of the first class is received to both public and private audiences by the chief executive or the sovereign to whom he is accredited; a minister of the second class generally to private audiences only. Diplomatic ministers are entitled to conduct negotiations either directly with the sovereign or chief executive, or with the minister or secretary for foreign affairs. The latter course is more usual, and generally more convenient.

The U. S. govt. until 1893 allowed its accredited representatives at foreign courts no higher rank than that of minister, but in that year Congress empowered the Pres. to raise to the rank of ambassador extraordinary and plenipotentiary the American minister accredited to any state which should previously confer a similar promotion upon its minister at Washington. Great Britain, France, Italy, and Germany quickly promoted their representatives at Washington, and the U. S. raised the rank of her representatives at the courts of St. James, Paris, Rome, and Berlin. For the rules and usages of the U. S. diplomatic service, etc., see AMBASSADOR: DIPLOMACY. The title 'Excellency' has, since the peace of Westphalia, been accorded to all diplomatic ministers of the first class; and in some courts it is extended to ministers of the second class, or at least those sent by the great powers. For the immunities and privileges of diplomatic agents, see AMBASSADOR: DIPLOMACY: ENVOY: CONSUL.

MIN'ISTRY, in Executive Government: the body of ministers of state, or of heads of departments in the government, to whom the chief magistrate or sovereign of a country commits the superintendence of executive administration.—In Great Britain, the CABINET is composed of a limited number of privy councilors holding the more important offices in the M.; and the individuals who thus form the cabinet are selected by the prime minister, who presides at its meetings.

It is a principle of the constitution of Great Britain, that the sovereign is irresponsible, the real responsibility resting with the administrative government. The 'King's Council,' or PRIVY COUNCIL, were the earliest advisers of the sovereign in matters of state; but when

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this body, in course of time, was found too large for dispatch of business, its duties were transferred to a small committee of privy councilors selected by the king. As late as in Charles I.'s time, all the more important resolutions of the crown were taken after deliberation and assent of the Privy Council. An unsuccessful attempt was made in the reign of Charles II. to restore the council to its original functions. Its numbers were limited to 30; and it was intended that this limited council should have control of the whole executive administration, superseding any interior cabinet. But the council was found too extensive for an effectively working ministry, and the former arrangement was restored. The cabinet may be regarded as but a committee of the Privy Council (q.v.); and its exclusive right to discuss and determine the plans and business of the govt. has been often said not to be recognized by the law; a position which, however, was disputed by Lord Campbell, who maintained that, 'by our constitution, it is in practice a defined and acknowledged body for carrying on the executive government of the country.' The cabinet is a merely deliberative body; its members collectively have no power to issue warrants or proclamations; but all important measures which engage the attention of the govt., whether regarding matters domestic, foreign, or colonial, and all plans of action, whether purely administrative, or to be carried out in parliament, must be proposed, considered, and adopted by the cabinet. The sovereign intrusts the formation of a ministry to a statesman, who selects for its members those who agree in his political views. He generally places himself at the head of the govt. as First Lord of the Treasury, and in popular language he is called the Premier, or Prime Minister. The Lord Chancellor, the Chancellor of the Exchequer, the Secretaries of State for Home, Foreign, Colonial, and Indian Affairs, the Secretary of War, and the Pres. of the Council, are necessarily members of the cabinet; also generally the heads of various other important departments of govt., including usually the First Lord of the Admiralty, Pres. of the Board of Trade, Postmaster-gen., Pres. of the Poor-law Board, Chancellor of the Duchy of Lancaster, and occasionally Chief Sec. for Ireland. The Premier has sometimes held the office of Chancellor of the Exchequer in conjunction with that of First Lord of the Treasury. A privy councilor of great political weight is sometimes called into the cabinet without office, and takes the post of Lord Privy Seal. Her Majesty's ministers who have usually no seat in the cabinet include the following: Chief Sec. for Ireland, First Commissioner of Works, Vice-pres. of the Board of Trade, Vice-pres. of the Committee on Education, Commander-in-chief, Lord Chamberlain, Steward, Master of the Horse, Master of the Buckhounds, Comptroller of the Household, Lord Lieut. of Ireland, Attorney-gen. and Solicitor-gen. of England, Lord Advocate and Solicitor-gen. of Scotland, and Attorney-gen.

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and Solicitor-gen. of Ireland. Occasionally, but exceptionally, the Commander-in-chief, and the Lord Chief Justice of England, have been members of the cabinet. A M. is often spoken of as the M. of the person who is at its head, and sometimes as his government.

Meetings of the cabinet are held on the summons of any one of its members, usually at the Foreign Office. Its proceedings are secret and confidential, and no record is kept of its resolutions, which are carried into effect by those of its members to whose departments they severally belong. As the acts of a M. are at all times liable to be called in question in parliament, it is necessary that the heads of the chief departments should have seats in either house, in order to be able, when required, to give prompt explanations.

A govt. exists only so long as it can command the confidence of parliament. The sovereign has the power to dismiss his ministers whenever they cease to possess his confidence, but such a change would be useless without the support of the house of commons, who, by withholding their support, could paralyze all the functions of government. A sovereign has sometimes rid himself of a M. with whose policy he was dissatisfied, by dissolving parliament, and appealing to the country. Where a M. cannot command the confidence of parliament, i.e., when their important measures are rejected or discarded by its significant vote, they resign, and a statesman of some other political party is sent for by the sovereign, and authorized to form a new cabinet. All the adherents of a M. filling political offices resign with it, also the great officers of the court, and those officers of the royal household who have seats in either house of parliament. Sometimes officers holding lucrative appointments which do not necessitate resignation, have retired, as a manifestation of adherence to their political friends. In addition to the ministers already named, the following adherents of the M. go out of office on a change of govt.: the three junior Lords of the Treasury, the two Secretaries of the Treasury, the four parliamentary Under-secretaries of State, Paymaster-gen., Master-gen. of the Ordnance, Surveyor-gen. of the Ordnance, the five junior Lords of the Admiralty, first Sec. of the Admiralty, Chief Commissioner of Greenwich Hospital, Pres. and Parliamentary Sec. of the Poor-law Board, Pres. of the Board of Health, Vice-chamberlain, Capt. of the Gentlemen-at-arms, Captain of the Yeomen of the Guard, the Lords in Waiting, Mistress of the Robes, Treasurer of the Household, Chief Equerry, or Clerk Marshal, Judge Advocate-gen., and the Lord Chancellor for Ireland. The private sec. to a minister loses office on a change, his appointment being purely personal; and some changes are usually, though not always, made in ambassadors extraordinary.

In the United States there is no M. in the British use of that term: the chief ministers are the superintendents of the great executive departments of government;

MINTUM—MINK.

they are known as Secretaries, and as a body they form an advisory conference known as the President's Cabinet. They are chosen and appointed by the president, and take office on confirmation by the senate; they hold office entirely at the will of the president, and they administer their functions as under his direction and with immediate responsibility to him. They are held to administer in their respective departments the executive control which the laws vest in the president; thus their functions are of high importance and honor, and their influence is great, so long as they hold his confidence. They meet statedly, or as summoned by the president, in advisory conference; but they are not an executive council issuing orders, nor is the president under any legal obligation either to ask or to follow their advice: this illustrates the fundamental difference between the Cabinet of Secretaries of the President of the United States, and the Cabinet of Ministers of the British Crown.—The members of the Cabinet number eight: Sec. of State, Sec. of the Treasury, Sec. of War, Sec. of the Navy, Sec. of the Interior, Postmaster-gen., Attorney-gen., Sec. of Agriculture: see SECRETARIES of Executive Departments.

MINIUM, n. *mīn'ī-ŭm* [L. *miniŭm*, red lead or vermilion]: red oxide of lead; red-lead ore: see LEAD.

MINIVER: see MINEVER.

MINK (*Mustela lutreola*): quadruped, a species of weasel, inhabiting northern Europe and Asia; very similar to which in characters and habits is another species, by some regarded as only a variety of the same, the M. or VISON (*M. vison*) of N. America, abundant in almost every part of that continent. Both inhabit the neighborhood of streams, lakes, and marshes; have semi-palmated feet, are expert swimmers and divers, and prey on fishes, frogs, and other aquatic animals, also on birds, rats, mice, etc. They are covered with downy fur, interspersed with longer and stronger hairs: the color is brown, with more or less white on under parts. The American M. is generally larger than that of the old world, being often more than 18 inches from the nose to the root of the tail, while the latter is seldom more than 12 in. It has also a more bushy tail. It is very active and bold, and often commits great depredations in poultry-yards, carrying off a fowl with great ease. Unlike most of its congeners, it is easily tamed, and becomes much attached to those who caress it. In domestication, it ceases to regard the inmates of the poultry-yard as prey. It emits an unpleasant odor only when irritated or alarmed. The fur of the M. is valuable.

MINNEAPOLIS.

MINNEAPOLIS, *mĭn-ĭ-ăp'ô-lĭs*: city, cap. of Hennepin co. Minn., on both sides of the Mississippi river, at the falls of St. Anthony; lat. $44^{\circ} 58'$ n., lon. $93^{\circ} 15'$ w.; 8 m. w.n.w. from St. Paul (10 m. by rail and 14 m. by the course of the river); about 838 ft. average elevation above sea-level. About three-fourths of M. lies w. and s. of the river, which enters it on the n. a little w. of the middle of the n. boundary, flows on a curve, which passes to the left of the city centre, and goes s.w. out of the city, thus inclosing in a bow the n. e. quarter of the site. A large island in the river, named after the explorer Nicollet (q.v.), a little n. of the centre of the city, is built on, and both city and railway bridges conduct across it near the heart of the city. A second island lower down, of less size, has another historic name, Hennepin. Above and below the islands several other long bridges span the Mississippi for railway travel or for ordinary passage. The general nature of the site of M. is that of a broad esplanade, nearly level for from one to two m. back from the river, with chains of wooded bluffs beyond, on which there are many fine residences. The situation is healthful, as there are no marshy grounds near, and the natural drainage is excellent. The soil is a sandy loam, above a layer of gravel, which rests on limestone, and that on a soft sandstone. The falls of St. Anthony are overlooked by the city, and 3 m. below it a beautiful resort is afforded by the Minnehaha Falls (q.v.). In the vicinity of M. are numerous lakes, especially on the w. and s.w., which greatly add to the attractions of a remarkably beautiful region. They have already become summer resorts comparable to some of those noted at the East.

The falls which have contributed so much to the prosperity of M., were discovered, and named for St. Anthony, 1680, by Father Louis Hennepin, a priest who accompanied the Fr. explorer Accault in his upper Mississippi journeyings. They remained little known for nearly 140 years, until, 1819, the establishment of Fort Snelling, at the mouth of the Minnesota river, abt. half way between the falls and the site of St. Paul, brought them again under observation. The milit. reservation of Fort Snelling extended over most of the present site of M., and thus included the vicinity of the falls. These occur in the course of a descent of the river amounting to 80 ft. within a m., and 65 ft. within three-quarters of a mile. They are formed by a perpendicular face of sandstone, 18 ft. high, and divided into two by Hennepin Island. The attractions of the spot are those not only of the fall of water, but also of the surrounding view. The division of the river into an e. and a w. channel, gives on the w. side, which has the largest channel, one of the most remarkable water-powers known. Even at a low stage the river precipitates down its bed of solid limestone, 450,000 cubic ft. of water per minute. The force is computed to be equal to 100,000 actual horsepower (or 120,000 theoretical). The shores are of such

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a character, passing round the long side of the bend of the river, as to allow canals to be excavated by the side of the stream to any extent, with the best of rock for their walls and bed, yet rock not difficult of excavation. The hard limestone, moreover, of the bed of the river, affords a secure foundation for dams and for mills. The canal by which the power is taken, branches off from the w. channel a short distance above the falls. It is 60 ft. wide and 14 ft. deep, and passes by a course parallel to the river down to the mills. Nothing in the entire system is ever liable to injury by floods, the rise of the river always taking place so gradually as to preclude destructive freshets. There has been some solicitude concerning the ultimate wearing away of the falls. The drawing of all the water through the canals, often leaves the ledge exposed to the rapidly disintegrating action of frost, and when a great volume of water is pouring over the ledge another injurious action results. The easily worn sandstone at the bottom of the falls, is cut away by the water, and the ledge becomes undermined, and liable to give way: 90 ft. did give way at once 1851. The river banks show that the falls have already receded from the mouth of the Minnesota river 9 m.; and there remains only 1,200 ft. in length of the rock bed which makes the falls. The earliest attempt to provide against the peril of destruction of the falls only made the matter worse, but the building of a concrete wall behind the falls and underneath the channel of the river—a wall 4 ft. thick and 38 ft. in height, entirely across the stream, and 50 ft. into the bank on each side—has effectually removed the danger of undermining the ledge. At the same time an apron, or inclined plane, of timber, with heavy crib-work filled with stones, serves to protect the falls from wearing away. This work cost \$884,500, of which the United States furnished \$550,000, and M. the rest. In 1879 a sluiceway was built on at the w. end of the apron, 6 ft. wide and 346 ft. long, for the passage of logs without damage to the apron. This was done by the U. S. govt., in whose hands the falls now are for preservation.

The river is navigable eight months in the year below the falls, and with proper improvements would have five ft. of water at all times. Above the falls light draft boats may ascend 80 m. at any time, there being two ft. of water at the lowest stage. There are 16 railroads connecting with M., with 15,000 m. of track. The chief lines are the Chicago Burlington and Northern, Chicago St. Paul Minn. and Milwaukee, Wisconsin Central, Minn. St. Paul and Sault Ste. Marie, St. Paul and Duluth, Northern Pacific, Great Northern, St. Paul Minn. and Manitoba, St. Paul Minn. and Omaha, and Minn. and St. Louis.

The climate of M. is healthful and bracing, being especially sought because of the dry and tonic character given by the prevailing winds and by the absence of marshes, or of waters or lands liable to affect it unfavorably. The

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highest recorded summer temperature is 101°; the highest in average years 94°; the mean 67°. The lowest winter temperature — 40°; the lowest in average years — 30°; the mean, 12·5.

M. is regularly laid out over 52½ sq. m. of territory; the streets and avenues are straight, usually 80 ft. wide, and in the residence quarters are made attractive by fine grounds, commonly without fences. Shade trees are generally set out; and in all streets outside the business portion about one-fourth the width is occupied by grass and two rows of trees on each side, with foot-walks six to eight ft. wide between the rows. An extended service of horse-cars exists through the chief avenues. The street railway combination covering Minneapolis (52½ sq. m.) and St. Paul (55·44 sq. m.)—the city limits meeting so that the e. side of Minneapolis bounds the w. side of St. Paul—contracted, 1890, Feb., for an electric railway equipment of the entire system, at a cost of nearly \$2,000,000, to be in operation June 1. The Sprague Electric Railway and Motor Co. supply under this contract 360 motors. Electric lighting has been introduced.

No artificial parks have been made, the groves, lakes, etc., of the suburbs more than supplying their place. There are four lakes within 3½ m. of the city, also the falls of Minnehaha. There are five cemeteries connected with the city: Lakewood, 3½ m. s. from the city centre, 153 acres; Layman's, 2 m. s.e., 20 acres; Maple, 1½ m. n.e., 10 acres; a Rom. Cath., and a Hebrew cemetery. The water-works are owned by the city. The Holly system of direct pumping is used, with average pressure 53 lbs. The works cost, with mains and pipe 18 m. 3,461 ft. in length, and a daily capacity of 7,500,000 gals., \$396,598.83. The gas-works are not owned by the city. The number of fine edifices is very large, including the Chamber of Commerce, the Exposition Building, the residence of W. D. Washburn, which cost \$1,000,000, the Post-office, costing \$750,000; the West Hotel, costing \$1,500,000; the Lumberman's Exchange, the Tribune Building, the Syndicate Block, and the Masonic Temple. There are a city hall, city prison, several engine-houses, two opera-houses, an athenæum, several national and several private banks, ten fine public school buildings, an academy, two female seminaries, and a medical college.

The number of schools is about 30. Higher institutions of learning are the University of Minnesota; the Augsburg Theol. Seminary established 1869 by the Scandinavian Lutherans of the northwest; and Macalester Coll. The churches number over 100, representing 15 denominations, of which the more numerous are the Meth.; Lutheran; Baptist; Congl.; Presb.; Episc.; Rom. Cath.; and Univ. There are six daily and 39 weekly newspapers; also 10 semi-monthly and 13 monthly publications.

The govt. of M. is by a mayor and a board of aldermen, two from each of the ten wards into which the city is divided. The fire dept. is equipped with steam fire-en-

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gines, hose carriages, hook and ladder trucks, and an adequate force of disciplined men. A fire-alarm telegraph is in use.

M. is the chief manufacturing and distributing point for the timber lands of the whole upper Mississippi valley. The country in the immediate vicinity is divided between production of grain and of stock. Of the wheat produced in Minn. and sent to market, more than half is manufactured into flour by the mills of M. There are over 20 elevators with capacity of more than 15,000,000 bushels. There are 26 flouring-mills, with capacity of 36,148 barrels daily. They make into flour 20,000,000 bushels of wheat in a year, by processes which have revolutionized the production. The three mills of Washburn, Crosby and Co. can make 6,500 barrels of flour daily, employing 281 hands. The Pillsbury 'A' mill is the largest in the world, and has a daily capacity, fully equipped, of 25,000 bushels of wheat. There were in 1900 2,368 manufacturing establishments, employing 26,688 persons and paying wages \$12,708,523; using materials valued at \$78,175,735; products, \$110,943,043. The principal articles were, flouring and grist mill products, \$49,673,568; carpentering, \$5,412,038; foundry and machine shop products, \$2,570,601, and masonry supplies, \$2,267,773. 1902, Sept. 15, there were 4 national banks, cap. \$3,250,000, 17 state banks, \$2,820,000; 5 fire insurance cos.; assets (of 4 reporting) \$1,085,209; liabilities \$273,804.

History.—The first saw-mill was built 1822, and grist-mill added, for the use of Fort Snelling. The Indians ceded the lands e. of the river 1837, and 1838 the first settlement was made. Persons from Boston bought a large share of the water-power, 1847, and a dam was completed across the e. channel, from Hennepin Island to the main shore, 1848. Minn. Territory was organized in the winter of 1848-9, but the lands w. of the river were still Indian, and most of the site of M. was within the Fort Snelling govt. reservation. The first permits to occupy land were got 1849, and the first house in w. M. begun. In 1853 there were about a dozen houses. Pre-emption rights were granted 1855, and a town govt. was organized 1858. The city charter dates from 1867. Till this time, the settlement on the e. side of the river had been, from 1849, known as St. Anthony, and had become a city 1855. In 1873 the two were consolidated as Minneapolis. 1890, June, the total milling capacity of M. was over 25,000 barrels a day. Two years before an explosion and fire destroyed six of the largest flouring-mills, half the producing power of the milling district, but they were all rebuilt in the next two years, with increased capacity. Pop. (1870) 13,066; (1880) 46,887; (1885) 129,200; (1890) 164,738;)1900) 202,718.

MINNEHAHA—MINNESINGERS.

MINNEHAHA RIVER, *mĭn-ĭ-hâ'hâ* (and **FALLS**): small stream in Hennepin co., Minn., to which the Dakota Indians gave the name *Minne-haha*, or water-laughing. Half a mile above its mouth, where the channel passes over a limestone precipice 60 ft. high, the waters make falls of remarkable beauty. The mouth of the M. river, where it enters the Mississippi river, is three m. below Minneapolis, and the falls are among that city's most interesting pleasure resorts. The city has provided at the M. falls a site of 51 acres for a soldiers' home, with the design of making it eventually a part of its park system. This home was opened 1887, November.

MINNESINGERS, *mĭn'ně-sĭng-ĕrz*: designation of the earliest lyric poets of Germany, 12th and 13th c.; from *Minne*, love, which was at first their predominating, and almost sole subject. The works of the M. are mostly superior to those of their more generally known contemporaries the troubadours, in delicacy of sentiment, elegance and variety of rhythmical structure, and grace of diction. Henry of Veldig, early in the 12th c. at the court of the Swabian, Frederick Barbarossa, Emperor of Germany, is regarded as the father of the M., and Walther von der Weide (b. abt. 1170) as the last of this great vocal band, which included emperors, princes, nobles, and knights. Many of their productions have perished, though, in addition to a very large collection of poems by anonymous M., there are some remains of the songs of more than 150 known composers. Among the most celebrated of these are: Wolfram von Eschenbach (q.v.), Henry von Ofterdingen, Hagenau, Hartmann von der Aue (q.v.), Gottfried von Strasburg (q.v.), Otto von Botenlauben, Truchsess von St. Gall, and Ulrich von Lichtenstein—men of noble houses, who, though they belonged to various parts of Germany, wrote almost exclusively in the Swabian dialect, which, during the brilliant days of the Fredericks and Conrads of the House of Swabia, was the language of the court in Germany. Among the few other forms of German employed by the M., the one next in favor was the Thuringian, adopted in compliment to Hermann, Landgraf of Thuringia, who, next to the princes of the Swabian dynasty, was the most munificent patron of the M. during the period of their renown, in the early part of the 13th c. Besides songs in praise of women, the M. composed odes on public or private occasions of lament or joy, distiches or axioms, and *Wachtlieder*, or watch-songs, in which the lover was represented as expostulating with the watchman, who kept guard at the gate of the castle within which his lady-love was imprisoned, and trying to persuade him to grant him admittance to her presence. These songs and odes were recited by the composer, to his own accompaniment on the viol; and as few of the M. could write, their compositions were preserved mostly by verbal tradition only, and carried by wandering minstrels from castle to castle throughout Germany, and even beyond its borders. As the variety of rhythm and

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complicated forms of versification affected by the M., especially toward the decline of their art, rendered it difficult to retain by memory the mass of Minnesong which had been gradually accumulated, these itinerant musicians finally made use of written collections, a practice to which alone we are indebted for the many beautiful specimens of early German lyrical poetry which remain. The glory of the M. may be said to have perished with the downfall of the Swabian dynasty under which greater liberty of thought and word was allowed among Germans than they again enjoyed for many ages; and in proportion as the church succeeded in re-asserting its sway over the minds of men, which it had lost under the rule of the chivalric Fredericks, freedom of speech and action was trammelled, and song and poetry contemned. Paraphrases of Scripture, hymns, and monkish legends, took the place of the chivalric songs of the nobly born M., and German poetry was for a time almost annihilated.

In the 14th c., the art of Minnesong was partially revived, though under a rude and clumsily elaborated form, by the *Master-singers* (Meistersingers), a body of men belonging to the burgher and peasant classes, who, in accordance with their artisan habits, formed themselves into guilds or companies, binding themselves to observe certain arbitrary laws of rhythm. Nuremberg was the focus of their guilds, which rapidly spread over the whole of Germany, and gained so firm a footing, that the last of them was not dissolved at Ulm till 1839. As the title of master was awarded only to a member who invented a new form of verse, and the companies consisted almost exclusively of uneducated persons of the working-classes, it may easily be conceived that extravagances and absurdities of every kind speedily formed a leading characteristic of their modes of versification; attention to quantity was, moreover, not deemed necessary, regard being had merely to the number of the syllables, and the relative position and order of the verses and rhymes. Their songs were lyrical, and sung to music; and though, each master was bound to devise a special *stole* or order of rhymes for each of his compositions, these stoles were subjected to a severe code of criticism, enacted by the *Tabulatur*, or rules of the song-schools. Among the few masters who exhibited any genuine poetic feeling, the most noted were Heinrich Mügeln, Michael Behaim, and the Nuremberg shoemaker, Hans Sachs, who prided himself on having composed 4,275 *Bar* or Master Songs. See Tieck's *Minnelieder* (1803); Taylor's *Lays of the Minne and Master Singers* (Lond. 1825); and Von der Hagen's *Minnesänger* (4 vols. 1838).

MINNESOTA.

MINNESOTA, *mĭn-ĕ-sō'ta*: state, one of the United States of America; 19th in order of admission into the Union; 26th in population 1880, 20th in 1890, and 19th in 1900; in 1902 2d in flaxseed, 1st in spring wheat, 4th in oats, 3d in barley, 5th in cattle, 8th in horses, 26th in sheep, 11th in swine, and 7th in oats and acreage of grass mown; 10th in railroad mileage. The name, from the Minnesota river, means 'water-sky-tinted.'

Location and Area.—M. is at the head of the upper Mississippi valley, lat. $43^{\circ} 30'$ — $49^{\circ} 24'$ n., long. $89^{\circ} 39'$ — $97^{\circ} 5'$ w.; bounded n. by the Dominion of Canada, the line running on the 49th parallel from the Red river of the north to the Lake of the Woods, thence n. to inclose a fragment of territory w. of the lake, and s. of its n.w. angle, thence descending s. and s.e. through the lake, down Rainy Lake river, through Rainy and other lakes, and down Pigeon river to Lake Superior; e. by Lake Superior and Wis., the line from the lake following the St. Louis river to its first rapids, then falling due s. to the St. Croix river, thence by the St. Croix to the Mississippi river, and down this river 134 m. to the s.e. corner at lat. $43^{\circ} 30'$; s. by Iowa; w. by Dak., the line being a due n. line from the Io. boundary to the s.e. outlet of Big Stone Lake, the head of M. river, thence through the lake, along the line of Lake Traverse, of the Bois des Sioux river to its junction with the Red river of the north, and thence by this river to the n.w. corner. The extreme length n. and s. is 380 m.; greatest breadth in the n. 337 m.; on the s. boundary 262 m.; opposite the mouth of the St. Croix 183 m.; area, 83,531 sq. m. (53,459,840 acres); greatest elevation above sea-level 1,680 ft.; extent of navigable waters, shore line of 2,746 m.; water line of 1,532 m.; river navigation about 1,200 m.

Topography.—The surface is in general an undulating plain, averaging about 1,000 ft. elevation above sea-level, with broken highlands in the extreme n.e. drained by tumbling streams which go n. into Rainy Lake chain or s. into Lake Superior; alluvial levels in the n.w. belonging to the Red river valley; a group of low flat-topped elevations extending across the middle of the n. part of the state and serving as the gathering-place of the head waters of the Mississippi river; and thence s., over the whole breadth of the state, a gradual slope, determining the descent of the Mississippi river, covered to about the centre of the state with the great belt of pine woods which reaches across from Lake Superior to the Red river valley; below the centre of the state, a region of rolling prairie, dotted with lakes and groves; and along the Minnesota river, from n.w. to s.e., across the s.w. corner of the state, a tract, more than 40 m. wide and 100 m. long (5,000 sq. m. in all), which forms a belt of hardwood trees, known as the Big Woods. Not only is the region of low hills and lakes, at the centre of the n. part of the state, the source of the Mississippi river

(q.v.), 797 m. of which belong to M., but the three great continental river systems, of the Mississippi, the Red river of the north, and the great lakes, and the St. Lawrence, about equally claim this continental crown of land as their place of beginning. Of the last the St. Louis river is the head, beyond the remote w. end of Lake Superior. The St. Croix river on the e., where it is a boundary for 129 m., of which 53 are navigable, and the Minnesota river, in a long loop across the s. part of the state, help to gather the vast mass of Minn. waters into the Miss., and make it from the confluence of the St. Croix a stream of the first magnitude. The Red river of the north gathers its waters in part along the upper half of the w. side of the state; and the Des Moines, for about 135 m. has its head stream in the s.w. corner of M., becoming navigable 20 m. before it passes into Iowa, on its way to give the Mississippi the waters of more than 10,000 sq. m. of that state.

The number of the lakes of M. is not less than 7,000, of all sizes, from a mile to 30 m. in diam., many of them having an area of more than 100 sq. m., and the whole aggregating a water surface, in the state, of 4,160 sq. m. Seldom marshy, their waters clear and cool, abounding in various kinds of fish, and their shores skirted with forest growth of every kind, they contribute at once to the beauty of the landscape and to the temperate and pure quality of the air of a region which is exceeded in salubrity by no part of the continent. They are largely of glacial origin, and form part of the s. fringe of the lake region of N. America.

Climate.—The central continental elevation of M. has climatic effects rarely combined. There are no superfluous spring and autumn rains, no prevalence at times of fogs and damp weather, and no injurious extremes of heat and cold. Days of hottest weather in summer are joined with nights delightfully cool, making the conditions of both vegetable and animal life ideally favorable; and the lowest cold of winter is so modified by the dryness of the air as to have no extreme severity, even for sensitive invalids, but rather an invigorating energy extremely favorable to health and activity. The average temperature, for 35 years, at St. Paul, was: for spring $45^{\circ}6$; summer, $70^{\circ}6$; autumn $40^{\circ}9$; winter $16^{\circ}1$; average of the year $44^{\circ}6$. The average of the hottest week in summer is 85° to 90° ; that of the coldest week of winter -10° to -20° (below zero). The average rainfall is about 25.5 in. annually, less than two in. being in winter, and about 12 in. being in summer. 70 per cent. of the yearly heat falls in the season of vegetable life; and 76 per cent. of both the rainfall and the atmospheric humidity. The prevailing winds are from the s. or s.e.

A remarkable fact of the topographical climatic position of M. is, that it appears to be but the gateway to a continental plain, extending n.w. far up to the 60th parallel, in the valley of the Peace river, its breadth reaching from 60 m. w. of Winnipeg 900 m. across to the des.

ert lands next e. of the Rocky Mts., and its area of temperature and soil highly favorable to human habitation and culture; crossing the systems of the Red, Assiniboine, Saskatchewan, Athabasca, and Peace rivers, over a region prepared by the character of its lands, and the continental flow n.w. of temperate air, to make many such great breadths of culture and population as the states of Minn., Io., and Illinois.

Geology.—The rock foundations of M. are chiefly azoic or the lowest protozoic. A central zone reaches from n. of Lake Superior diagonally across and down to the s.w. corner of the state, its granitic and metamorphic rocks forming rough hills in the extreme n.e., of considerable mineral wealth, but through the rest of their field having an ample covering of clays, sand, gravel, and boulders, of glacial origin; overlaid by a sandy loam, which is very finely ground, rich in organic matter, deep brown or black in color, and of the greatest fertility. The e. slope, from the central watershed built up by the line of azoic rocks, bears a heavy growth of pine, spruce, and other coniferous trees, the Lake Superior end of the pine timber belt covering nearly a third of the state, but it has a comparatively sterile soil. The n.w. part of the state, on the other side of the watershed, is supposed to have a cretaceous foundation, and on it lies a great depth of drift and alluvium of the highest value for grain and grass, and for forests of oak, beech, elm, and maple. S. and e. of the central zone of azoic foundations, there lies under the rolling prairies, the groves, belts of forest, and numerous lakes, a stretch of sandstone, in part Red Potsdam. The lower Magnesian limestone underlies the extreme s.e. part of the state; the Trenton limestone occupies a large field in the s. and s.e., a valuable breath of it underlying the cities and vicinity of St. Paul and Minneapolis; and other limestones and sandstones crop out in the bluffs of the Mississippi and the banks of the Minnesota rivers.

Zoology.—The prairies and forests of M. were abundant in elk, deer, antelopes, bears, gray and prairie wolves, wild cats, foxes, raccoons, rabbits, squirrels, gophers, and woodchucks. Of aquatic animals the beaver, otter, mink, and musk-rats abounded. Grouse, wild turkeys, partridges, pigeons, quail, plover, larks, bald and golden eagles, hawks, buzzards, owls, etc., were very numerous; also wild geese, wild ducks, brant, pelicans, teal, loons, etc.; and a great variety of song and plumage birds. A partial list of birds counts 281 species; and of winter birds 52 species have been counted, 23 of which are permanent residents. In the numerous waters belong pickerel, pike, bass, sun-fish, white-fish, trout, etc.; and through a fish commission many waters have been stocked with black bass, lake and brook trout, lake white-fish, etc. During 1885 and 6 the commission distributed in the waters of the state 22,813,147 fish, and 14,100,000 eggs, including the most

desirable species of food-fishes adapted to the lakes and streams.

Agriculture.—In 1880 M. had 92,386 farms, comprising 13,403,019 acres, valued at \$193,724,260; of which 7,246,693 acres were improved, and 4,503,716 were under tillage, with farm machinery and implements valued at \$13,089,783. The breadth of tillage for wheat, oats, corn, barley, and flax, was (1886) 5,140,327 acres; (1887) 5,506,506 acres; (1888) 5,512,050 acres. The acreage and yield 1889 were, wheat 2,291,437 acres, 45,498,205 bush.; oats 1,394,555 acres, 48,253,799 bush.; corn, 688,622 acres, 22,115,769 bush.; barley, 332,017 acres, 9,105,209 bush.; flax seed, 157,540 acres, 1,647,622 bushels.

The chief staple of agriculture in M. has been wheat, with oats, Indian corn, barley, rye, and flax coming largely into the account. The wheat crop is almost wholly spring wheat, which has taken the preference in M. for milling which winter wheat has had elsewhere.

For 1880 the yield was 39,399,068 bush. of wheat; 22,867,932 of oats; 13,125,255 of corn; 2,751,638 of barley; 3,782,243 of potatoes; 397,190 of flax seed (90,494 acres, the seed only made account of); butter 15,693,283 lbs; hay 1,263,472 tons from wild grass, and 175,595 cultivated; wool 923,170 lbs. In wheat production the older lands fell off largely by 1882, while stock-raising showed advance of 100 per cent. in cattle, 40 in hogs, and 25 in sheep; and butter, corn, and wool were more than doubled, cheese quadrupled, and oats, barley, rye, buckwheat, and flax largely increased, from the general adoption of a system of rotation in crops. The first creamery erected was 1881, and 1883 there were 70. In 1881 the number of milch cows was 267,577; (1882) 272,681; (1883) 301,688. The butter product (1882) was 17,136,788 lbs. In 1889 (census 1890) the number of farms was 116,851, with a total average of 18,663,645 acres, or 160 acres per farm. Of this 11,127,953 acres were improved and 7,535,692 unimproved. The value of land, fences, and buildings was \$340,059,470; implements and machinery \$16,916,473; live stock on hand, June 1, \$57,725,683; farm products of the year \$71,258,230. Among these products were: barley 9,100,683 bu., buckwheat 281,705 bu., indian corn 24,696,446 bu., oats 49,958,791 bu., rye 1,252,663 bu., wheat 52,300,247 bu., hay 3,135,241 tons, Irish potatoes 11,155,707 bu., wool 1,945,249 lbs., milk 182,968,973 gals., butter 34,766,409 lbs., cheese 676,642 lbs. In 1895 M. had 1,152,458 acres in corn, producing 35,956,690 bu., valued at \$7,191,338; wheat 2,851,485 acres, 65,584,155 bu., value \$28,857,023, oats 1,954 acres, 77,995,084 bu., etc. In 1900 the farms numbered 154,659, comprised 261,248,498 acres, and were valued, with improvements, implements, machinery and stock, at \$788,684,642.

Manufactures.—M. had (1890) 7,505 manufacturing establishments with \$125,686,618 capital, employing 79,629 hands, paying \$38,189,239 in wages, requiring \$118,481,941 in materials, and yielding \$192,033,478 in products. The leading industries were, flouring and grist mill products, establishments 92, employees 1,469, wages \$979,142, ma-

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terials \$1,080,332, products \$2,835,024; lumber, saw-mill products, establishments 317, employees \$10,783, wages \$3,383,765, materials \$13,670,811, products \$21,013,010; lumber, planing-mill products, establishments 54, employees 2,715, wages \$1,529,177, materials \$1,132,575, products \$2,001,995; timber products not manufactured at mills, establishments 75, employees 5,991, wages \$1,261,453, materials \$1,499,538, products \$4,062,122; clothing, men's, establishments 278, employees 2,774, wages \$1,493,615, materials \$1,754,200, products \$3,958,454; cheese, butter, and condensed milk, establishments 115, employees 921, wages \$436,522, materials \$2,403,134, products \$3,300,619; slaughtering and meat packing (wholesale), establishments 21, employees 274, wages \$168,946, materials \$2,086,752, wages \$2,544,663; malt liquors, establishments 66, employees 658, wages \$412,682, materials \$751,907, products \$2,206,366; boots and shoes, factory products, establishments 8, employees 1,182, wages \$614,022, materials \$1,090,722, products \$2,032,814; brick and tile, establishments 117, employees 2,221, wages \$502,183, materials \$255,956, products \$1,116,739; agricultural implements, establishments 23, employees 602, wages \$363,080, materials \$418,619, products \$1,622,951; cooperage, establishments 59, employees 1,016, wages \$485,546, materials \$884,175, products \$1,687,060; foundry and machine-shop products, establishments 92, employees 1,469, wages \$979,142, materials \$1,080,332, products \$2,835,024; fur goods, establishments 25, employees 488, wages \$276,393, materials \$727,117, products \$1,152,369; furniture, establishments 83, employees 1,271, wages \$651,020, materials \$681,532, products \$1,903,989; iron work, establishments 13, employees 415, wages \$265,619, cost of materials \$808,803, products \$1,263,294; linseed oil, establishments 3, employees 99, wages \$66,938, materials \$1,140,450, products \$1,547,779; paving and materials, establishments 29, employees 1,209, wages \$555,448, materials \$519,522, products \$1,259,765; tobacco, cigars, and cigarettes, establish., 157. In 1900 M. had 11,114 manufacturing, with \$165,832,246 capital, and products valued at \$262,655,881.

The product of lumber for 1881, on the upper Mississippi river, was 339,162,197 feet; also 128,432,250 shingles, and 70,380,750 laths. The estimated amount of merchantable pine standing in M., 1880, May 31, was 6,100,000,000 ft.; being 2,900,000,000 on Mississippi river lands; 1,500,000,000 on St. Louis river lands (toward Lake Superior); 800,000,000 ft. on the shores of Lake Superior; 600,000,000 on Red Lake river, and other Red river of the north lands, in the n.w. part of the state; and 300,000,000 ft. on Rainy Lake and Rainy Lake river at the extreme n.e. of the state. The amount of lumber manufactured (1882) was 788,829,840 ft.; (1883) 745,618,862 ft.; (1884) 783,482,814 ft.; (1885) 656,051,060 ft.; (1886) 623,976,780; (1887) 540,000,000. The large falling off was in consequence of rapid destruction of forest wealth, threatening its exhaustion within a few years. Going northward the pine forest produces less and less lumber. Lakes, and tamarack and cedar swamps, cover much of the ground, and the pines are small and scattered. There is a belt

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of hard-wood forest w. and s. of the pine region of the upper Miss. river, consisting of white, red, and burr oak, sugar maple, poplar, etc., of which, in 1881, there was estimated to be standing 3,840,000 acres, capable of yielding 57,600,000 cords of wood (at average of 15 cords per acre). The cut for 1880 was 36,884,000 ft., besides 7,825,000 staves, and 547,000 sets of headings for cooperage use. The birch-lands are broken by tamarack swamps, and about one-tenth of their area is covered with patches of white pine.

Statistics for 1889 show decrease in lumber cut along the Mississippi river valley, n. of Minneapolis. such that the amount has reached only 48,870,684 ft., where in normal years, before the falling off, the cut has been as high as 180,000,000 ft. The entire territory covering Minn., the Mississippi valley s. as far as St. Louis, Wis., as far e. as the Wisconsin river valley, and all that tributary to the 'Soo' road, shows a decrease for 1889 in the production of lumber, amounting to 756,404,707 ft., the cut for 1889 being 3,467,436,593 ft. It shows an increase of shingles amounting to 196,326,900 ft., the cut being 1,581,576,550. Of lath there was a decrease of 23,048,239, the cut being 687,260,671. The Minn. production of lumber has been more affected than any other by this beginning of comparative failure of the forest wealth of the Mississippi valley.

Commerce.—M. had (1896) 98 vessels enrolled, tonnage 28,039·63, and 7 licensed, tonnage 122·59. Of these 8 were sailing vessels, 2,090·08 tons; 88 steam vessels, 22,584·52 tons; and 9 barges, 3,487·62 tons. M. had customs districts at Duluth and at St. Paul and Minneapolis. The imports and exports were: Duluth, imports \$1,609,823, domestic exports \$2,215,045, foreign exports \$1,472,045, total \$3,687,090; St. Paul and Minneapolis, imports \$1,463,471, domestic exports \$211,469, foreign exports \$92, total \$211,561. The internal revenue for 1896 was \$2,187,876·86; production of spirits, 1,549,695 gals.; fermented liquors, 463,293 gals. In 1902 the imports of merchandise, at the ports of Duluth and Minnesota City aggregated in value \$2,420,355, exports \$2,845,524.

Railroads.—In 1857 congress made a grant to M. of six sections per sq. m. of public lands in aid of railway construction, as a means of state development. This was increased to .10 sections (out of 36), so that more than one-fourth of the entire area of the state went for this purpose. The railroad companies were bound to pay, as tax, one per cent. of their gross earnings for the first three years, two per cent. for the next seven years, and three per cent. ever after. A railroad commissioner was intrusted with the oversight of all the companies. In 1863 M. had 31 m. of railroad; (1866) 298 m.; (1870) 1,092 m.; (1874) 1,833 m. of railroad completed; (1876) 1,984 m.; (1877) 2,120 m.; (1878) 2,608 m.; (1880) 3,110 m. The gross earnings (1879–80) were \$8,047,834, and \$10,774,826. In 1882 there were 3,749 m. of railroads, which had cost \$43,934 per m., total \$149,312,631. The

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subsidies in bonds and lands which the state had given the companies, amounted to \$76,489,790. The total earnings of the lines for the year were \$18,805,193; \$4,816,218 being for carrying 9,962,393 passengers; and \$13,158,697 being for carrying 5,883,120 tons of freight. The amount of taxes paid by the companies 1864-82, was \$2,641,334. The tax paid 1882 was \$470,593. In 1884 the number of m. of railroad was 4,162, total earnings \$23,243,466; (1886) 4,900 m., \$25,102,319 gross earnings, \$612,545 paid to the state as tax. Nine lines of railroad were in course of construction 1887, and 196 m. were completed during that year, carrying the railroad mileage to 5,096 m. In 1890 the mileage was 5,545, (1893) 5,947, (1894) 6,028, (1895) 6,054, (1896) 6,117. In 1895 the capital stock amounted to \$298,292,170, funded debt \$358,471,110, total investment \$690,456,132; gross earnings, passenger \$9,504,933, freight \$41,875,229, all sources \$54,335,343; net earnings \$18,896,157, interest paid on bonds \$17,524,214, dividends on stocks \$4,911,178.

Religion.—In 1890 M. had 3,429 church organizations, with 2,619 church edifices, having 691,631 seating capacity, valued at \$12,940,152; members 532,590, or 40.91 per cent. of the population. The leading churches were: Rom. Cath., 465 organizations, 271,319 members; Luth., 1,141 organizations, 145,907 members; Meth. Episc., 534 organizations, 30,837 members; Bapt., 194 organizations, 16,441 members; Congl., 175 organizations, 13,624 members; Presb., 167 organizations, 13,732 members; Prot. Episc., 171 organizations, 11,142 members; Adventists, 85 organizations, 3,023 members; Evang. Assoc., 134 organizations, 6,181 members; German Evang., 53 organizations, 5,567 members; Unitarians, 12 organizations, 1,349 members; Universalists, 13 organizations, 1,093 members.

Education.—A permanent school fund was early created by appropriating every 16th and 36th section of the public domain in land, being one-eighteenth of the whole. In 1874, there had been sold 450,357 acres, which, with sales of timber, had made a fund of \$3,030,127, from which the income was \$189,826.

By a law passed 1877, amended 1878, to provide uniform cheap text-books for the public schools, a system of supply, through district agents, at prices fixed by the state supt. of public instruction, was established. In 1880 the school districts numbered 4,244; school-houses 3,693, of which 69 were of stone, 158 of brick, 2,963 wooden frame, and 504 log structures; total value of sites and buildings \$3,156,210 (not including other school property). The enrolment was 180,248; teachers employed 1,874 male, 3,341 female; average monthly pay of male teachers \$35.29; of female \$27.52; total cost of schools for the year \$1,328,428—\$7.37 per scholar. For 1880-1, the number of new school-houses built was 597, at a cost of \$759,022, making the state total of school-houses 4,260, valued at \$3,947,857. The enrolment of pupils 1881 was 196,238; expended on schools for the year \$1,757,416. In 1884 the permanent school fund

stood at \$6,259,632. The grant of some 3,000,000 acres of land for schools, made by congress, had yielded \$5,467,032.90 of this, by the sale, at \$6.02 per acre, of 908,145 acres, leaving about \$12,000,000 still in prospect from sales of land. The public schools enrolment for 1884 was 223,209. During the two years 1883,4 there were erected 392 school buildings, cost \$1,085,170; and the whole sum raised in the two years for all educational purposes, was \$4,808,931.70. The enrolment 1885 was 225,215, expense for common schools \$2,620,721; (1886) 243,059, expense \$3,198,815.

The permanent school fund stood 1886 at \$7,303,166, with school fund land still unsold amounting to 1,887,571 acres. A new law of 1887 levied an annual tax of one mill on all taxable property, for the benefit of the schools. It produced (1888) \$486,670, and was found to be one of the greatest stimulants and benefits that the common schools had ever received. Great advantage had been found also in a new provision of the state constitution, permitting school districts to borrow from the school fund for building improved school-houses. In the first 21 months of the operation of the law, \$291,124.91 were thus loaned. The school fund 1888 had reached \$8,258,096.70, and the eventual expectation, from sales of land yet to be made, was, that the fund would rise to \$20,000,000. The report for 1895 gave the estimated school population (5-18 years) at 470,500, number enrolled 350,104, or 74.42 per cent. of school pop.; average daily attendance 164,747, or 47.05 per cent. of those enrolled; average number of days kept 154.8, aggregate days of school 25,502,836, or 54.2 to each person of school age and 72.8 to each pupil enrolled. There were 10,710 teachers employed, 2,439 males and 8,271 females; number of schoolhouses 6,583, value \$14,020,589; the receipts were, from permanent funds \$418,172, state taxes \$733,543, local taxes \$2,894,850, other sources \$578,551, total \$4,625,116; expenditures, for sites, buildings, and furnishings \$997,325, salaries \$3,084,461, other \$854,616, total \$4,936,402, or \$3.04 per capita. In the private schools there were 20,073, making the total enrollment 664,650. M. had 97 public high schools with 428 teachers (161 male and 267 female), 9,484 secondary students (3,865 male and 5,619 female), 35,302 students below secondary grades (16,963 male and 18,339 female); of these 464 were preparing for college in classical course and 1,949 in scientific course; graduates in 1895, 1,126, of whom 640 were preparing for college; total income from all sources \$414,217, libraries 60,984 vols. There were 28 private secondary schools, with 139 instructors, 1,416 secondary students and 1,379 elementary pupils; of these 90 were preparing for college, 38 in classical and 52 in scientific courses; graduates in 1895, 207, of whom 124 were preparing for college; income from all sources \$155,685, libraries 17,070 vols. M. had (1895) 11 colleges and universities; professors and instructors 296 (male 258, female 38), of whom 55 were in preparatory departments, 183 in college departments, and 89 in professional schools.

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Of students there were 722 in preparatory departments (463 males and 250 females), in collegiate departments 1,712 (males 1,321, females 591), in graduate departments 94 (males 63, females 31), in professional departments 764 (males 733, females 31).

In 1878 an act for the encouragement of higher education established a High School Board, having in view the securing of instruction in the high schools adequate to prepare pupils for the collegiate dept. of the university, not lower than the third or sub-freshman class. Under this law aid was to be extended, and 38 schools profited by it (1882), each receiving \$400. This aid was given 1883 to 49 schools; (1884) 53 schools, in which the pupils enrolled numbered 2,613. The whole number of high schools in the state 1886 was 59, with 3,195 pupils.

Normal schools have been in operation in M. since 1860, when that at Winona was opened. The others are, at Mankato, opened 1868; St. Cloud, 1869; Moorhead, 1888. In addition there are teachers in training courses in the following schools: Northwestern Christian College, Excelsior; University of Minnesota, Minneapolis; Gustavus Adolphus College, St. Peter; Parker College, Winnebago City; Dr. Martin Luther College, New Elm. In the public normal schools there were (1895) 1,516 students (397 males and 1,119 females), of whom 1,311 were in the normal department proper (276 male, 1,035 female); total income \$94,484, 12,638 vols. in libraries; in the normal departments of the colleges and universities were 14 teachers for normal students, 184 students (107 male and 77 female); total normal students in all institutions of the state 1,747.

The Univ. of M. was provided by the state constitution, as the crown of its educational system. It is at Minneapolis, on the e. side of the Mississippi river, a mile below the falls of St. Anthony. The present charter dates from 1868. The plan is that of an examining but not teaching univ. The studies usually assigned to the first and second college years are made preparatory, in a department carried on as secondary, and designed to be merged ultimately in the high schools of the state. The univ. studies are in one of the following colleges: (1) science, literature, and the arts, having three courses, of general studies, classical, scientific, and modern, on completion of which (in two years), the degrees are conferred of B.A., B.S., or B.L.; (2) agriculture, with a degree of B.AGR., after a two years course of study; (3) mechanic arts, with courses in civil or mechanical engineering; (4) medical, with nine professors, whose duty is confined to examining candidates for degrees. Post-graduate courses have been arranged. The pres. 1903 was Cyrus Northrup, LL.D. In 1896 the university had 168 instructors, 2,575 students, 50,000 volumes in library; receipts from all sources (1895) \$284,457, of which \$49,262 came from tuition fees, \$150,800 from productive funds, and \$39,750 from the U. S. government. The total amount of productive funds was \$1,040,000,

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The following colleges of liberal arts are reported in M. in addition to the univ.: St. John's Univ., opened 1857, at Collegeville, Rom. Cath., 18 profs. and instructors, 193 students; Hamline Univ., Meth. Episc., opened 1854 at Hamline, 11 profs. and instructors, 115 male and 126 female students; Macalester Coll., opened 1884 at Macalester, 8 profs. and instructors 83 male and 3 female students; Augsburg Seminary, Lutheran, opened 1869 at Minneapolis, 4 profs., 98 students; Carleton Coll., Congl., opened 1867 at Northfield, 19 profs. and instructors, 126 male and 138 female students. These and the Univ. of M. together reported (1888), 49,300 vols. in libraries, \$27,669 in scientific apparatus, \$1,727,639 in value of grounds and buildings, \$1,264,692 in productive funds, giving income of \$71,923, \$45,000 (the univ. alone) receipts from state or other public sources, \$16,-112 receipts from tuition, and benefactions \$245,586.

Newspapers and Periodicals.—In 1882 these numbered 219, of which 13 were daily journals. For 1890, newspapers are reported in 203 cities and towns, and numbering in all about 420. Of these 14 in Minneapolis and 16 in St. Paul have a circulation exceeding 5,000, two being dailies in Minneapolis and four dailies in St. Paul; five weeklies in Minneapolis and eight weeklies in St. Paul. There are 13 religious newspapers and periodicals in the state; 6 agricultural; 14 educational.

Illiteracy.—Persons 10 years of age and over enumerated (1890) 962,350; of these 58,057, or 6.0 per cent., were illiterates; male population 10 years of age and over 523,342, illiterates 25,993, or 5.0 per cent.; female population 10 years of age and over 439,008, illiterates 32,064, or 7.3 per cent.; total whites 10 years of age and upwards 957,662, illiterates 56,966, or 5.9 per cent.; native whites 10 years of age and upwards 508,615, illiterates 7,112, or 1.4 per cent.; foreign whites 10 years of age and over 449,047, illiterates 49,854, or 11.1 per cent.; colored population 10 years of age and upwards 4,688, illiterates 1,091, or 23.3 per cent.

Finances and Banking.—M. had on Feb. 1, 1897, a total state debt of \$1,509,000, all bonded, bearing an interest rate of 3½ per cent. per annum and due July 1, 1921. Of this \$554,000 was held in various state funds. The assessed valuation (1895) of real estate was \$556,135,887, personal \$85,114,394, total \$641,250,281; taxes levied \$14,770,864, or \$1.80 per \$1,000. In 1902, Oct. 31, the national banks numbered 140, with capital stock of \$13,695,440; U. S. bonds on deposit 4,610,100, circulation outstanding \$5,-144,246, M. also had in 1902 250 State banks with \$7,-524,150 capital and \$1,075,750 surplus; 275 private banks with \$3,775,820 and \$507,120.

In 1880 there were 30 national, 17 state, 75 private, and six savings banks. In 1884, of a total of 214 banks, 48 were national, 32 state, 128 private, and 6 savings. Of these, 149 reported a capital of \$15,954,754; 86 reported deposits \$27,284,117; loans and discounts \$37,-572,756. The number of banks 1886 was 237, of which only 107 were incorporated under either state or U. S.

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law, although the 130 all had corporate names, except 11.

History.—Jesuit accounts, as early as 1670–1, refer to the Indians of the region, Sioux or Dakotas, and Du Luth led the first trading expedition toward the Mississippi 1678, and later reached the great river by canoe passage from Lake Superior. Father Louis Hennepin, 1680, visited and named the falls of St. Anthony, and gave the first published report to the world. Perrot, a fur trader, came by the way of Fox and Wisconsin rivers to the Mississippi 1684, and founded the first trading-post, at Lake Pepin. Le Sueur ascended the Mississippi river to St. Anthony's falls 1700, and started a second trading-post. In 1763 English possession succeeded to French; and 1766 Carver entered on exploration of the upper Mississippi country. In 1783 Great Britain nominally yielded possession to the United States, and by the ordinance of 1787 all of M. e. of the Mississippi was included in the N.W. Terr., and under this should have become part of Wisconsin. In 1804 all of M. w. of the Mississippi became the n. end of upper Louisiana (with the present Io., Mo., Ark.). It was from 1812 that the United States first had control of the region. Fort Snelling was established 1821, and the first steamboat was seen in M. waters 1823. St. Paul dates from 1846. A bill to organize the terr. was passed by congress 1849, Mar. 3, when the pop. was but 4,057. In 1837 the cession had been made by the Indians of a small tract between the St. Croix and the Mississippi, and 1851 the Sioux ceded all the land w. of the Mississippi as far as to the Big Sioux river. 1857, Feb. 26, the enabling act for admitting the terr. into the union was passed, and 1858, May 11, M. became a state, the 32d of the United States, with a population of 150,037. As late as 1862 the Indians made an onslaught, over a large part of the state, upon the scattered settlements, massacred more than 700 people, took away captive 200, chiefly women, ravaged 30 cos., made 30,000 people homeless, and destroyed \$3,000,000 worth of property. The civil war 1860–65 drew out of the state 25,052 men, nearly one-seventh its pop. in 1860. But rapid growth repaired all losses. The census of 1865 (under state law) showed a pop. of 250,099. Railroad construction had been early begun, and was energetically pushed. It occasioned a difficulty in the matter of bonds issued in aid of companies which failed, but this was ultimately settled satisfactorily, while the state had meanwhile grown immensely in pop., wealth, and every element of prosperity and greatness.

Government.—The state constitution was adopted 1857, Oct. 13, and the government organized 1858, May. The state administration consists of a gov., elected to serve two years; lieut.gov.; sec. of state; treas.; and attor.-gen. The gov.'s salary is \$5,000. The state legislature consists of a lower house of 103 representatives, and a senate of 47 members, elected by districts. Its sessions are biennial and limited to 90 days. The judiciary is

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elective, the term of office seven years, and consists of a chief justice and four associate-justices of a supreme court; nine district courts, and a probate court in each co., besides justices of the peace with the usual minor jurisdiction, in matters not involving over \$100 or the title to real estate. The office of public examiner was created 1878, its duties (salary \$3,500) being constant supervision of the accounts of all institutions under the control and charge of the state. Railroads, insurance, and other large interests, are under supervision of special commissioners. In 1883 a board of public charities and corrections was created. A state dairy commissioner was provided by a law of 1885 (salary \$1,800) to secure the execution of the dairy laws in regard to pure milk, butter, and cheese.

The successive govts. with their terms of service have been: *Terr.* Alexander Ramsey 1849-53; Willis A. Gorman 1853-57, Samuel Medary 1857-58; *State*: Henry H. Sibley 1858-60; Alexander Ramsey 1860-64; Stephen Miller 1864-66; William R. Marshall 1866-70; Horace Austin 1870-74; Cushman K. Davis 1874-76; John S. Pillsbury 1876-82; Lucius F. Hubbard 1882-86; Andrew R. McGill 1887-8; William R. Merriam 1889-93. Knute Nelson, 1893-95; David M. Clough, 1895-99; John Lind, 1899-1901; Samuel R. Van Sant, 1901-05.

Counties, Cities and Towns.—M. divided into 82 counties. In 1880 the most populous *counties* were: Hennepin 67,013; Ramsey 45,890; Goodhue 29,651; Fillmore 28,162; Winona 27,197; Blue Earth 22,889; Rice 22,481; Stearns 21,956; and Olmstead 21,543; *cities and towns*: Minneapolis 46,887; St. Paul 41,473; Winona 10,208; Stillwater 9,055; Red Wing 5,876. In 1890 leading *counties* were: Hennepin 185,294; Ramsey 139,796; Stearns 34,844; Winona 33,797; Blue Earth 29,210; Goodhue 28,806; Fillmore 25,966; Rice 23,968; and Olmstead 19,806; *cities and towns*: Minneapolis 164,738; St. Paul 133,156; Duluth 33,115; Winona 18,208; Stillwater 11,260; Mankato 8,838.

Politics.—State, congressional, and pres. elections are on the Tuesday after the first Monday in Nov. The state govt. (1903) was rep., with a party majority of 23 in the sen., 73 in the house, 96 in joint ballot. Convicts and persons insane or under guardianship, are excluded from voting. M. is represented in congress by five representatives and two senators, and has seven electoral votes. Her votes for pres. and vice-pres. have been as follows: 1860, Abraham Lincoln and Hannibal Hamlin; 1864, Abraham Lincoln and Andrew Johnson; 1868, U. S. Grant and Schuyler Colfax; 1872, U. S. Grant and Henry Wilson; 1876, Rutherford B. Hayes and William A. Wheeler 5; 1880, James A. Garfield and Chester A. Arthur; 1884, James G. Blaine and John A. Logan 7; 1888, Benjamin Harrison and Levi P. Morton; 1892, Benjamin Harrison and Whitelaw Reid; 1896, William McKinley and Garret A. Hobart, 9; 1900, William McKinley and Theodore Roosevelt.

Population.—(1860) 172,023; (1870) 439,706; (1880) 780,773 (1890) 1,301,826; (1900) 1,751,394.

MINNESOTA RIVER—MINO BIRD.

MINNESOTA (or ST. PETER'S) RIVER: rising near the n.e. boundary of S. Dakota, flowing s.e. 300 m. to South Bend, then n.e. 120 m., and emptying into the Mississippi at Mendota. It is navigable 40 m. by steamboats.

MINNETONKA, *mĭn-ĕ-tŏn'ka*, LAKE: popular summer and fishing resort in the 'Big Woods' of Minn.: on the Pacific branch of the Minneapolis and St. Louis railroad: 15 m. s.w. of Minneapolis, 25 m. s.w. of St. Paul. It has communications with both cities by 6 regular trains each way during the summer. It covers about 16,000 acres, broken into 25 bays, and has an irregular shore-line of about 200 m. The bays are connected by narrow navigable inlets, and the banks and numerous islands are covered with maple, oak, basswood, elm and other forest trees. There are three villages on the lake: Excelsior on the s. shore; Waysata on the n.; and Mound City at the extreme end of Upper Lake. The large hotel which formerly accommodated transient summer guests was recently burnt down; many pretty and costly cottages have been erected along the lake by citizens of Minneapolis and St. Paul.

MINNEWASKA, LAKE: deep and clear lake, about three-quarters of a m. long, $\frac{1}{4}$ m. wide, held inclosed as in a rocky bowl on the summit of the Shawangunk Mts., Ulster co., N. Y.; 1,800 ft. above sea-level; 10 m. s.w. of New Paltz on Walkill Valley r.r.; 19 m. w. of the Hudson at Poughkeepsie, 98 m. n. of New York. The rock-formations here are very striking, the scenery is picturesque, and the air invigorating: these, with excellent hotels, make it a favorite summer-resort. Mohonk Lake is 9 m. distant.

MINNEWAUKAU, *mĭn'ĕ-waw-kaw'*, LAKE [Indian, Lake of the Great Spirit, Waukau] (formerly known as DEVIL'S LAKE): remarkable body of salt water in Ramsey and Benson cos., N. D.; 55 m. long and 3-10 m. wide.

MINNOW, n. *mĭn'nŏ* [Gael. *miniasg*, a minnow—from *mion*, small, and *iasg*, a fish; *meanbh*, little, small: F. *menu*, small: L. *minimum*, the least], (*Leuciscus phoxinus*): very small fish of same genus with the roach, dace, chub, etc., of a more rounded form than most of its congeners, a common native of streams with gravelly bottoms in most parts of Britain. It seldom exceeds three inches in length, the head and back of dusky olive color, the sides lighter and mottled, the belly white, or, in summer, pink. Minnows swim in shoals, feed readily either on animal or vegetable substances, if sufficiently soft, and are said to be very destructive to the spawn of salmon and of trout. The M. is a fish of very pleasant flavor. A casting-net affords the means of taking it in sufficient abundance. It is favorite bait for pike and trout. Several other fishes are called M. in N. Amer.

MINO BIRD: see MINA BIRD.

MINOR.

MINOR, a. *mī'nēr* [L. *minor*, less: comp. AS. and Ir. *min*, small: Icel. *minnr*, less]: less; smaller; inconsiderable; petty; unimportant; in *music* (see below): N. a person under age; one under 21 years; in Scotch *law*, a male person between the ages of 14 and 21 years, and a female person between 12 and 21 (see INFANT: RESTITUTION: GUARDIAN): in *logic*, the second proposition of a regular syllogism, called the *minor term*. MINORITY, n. *mī-nōr'ī-tī*, the period from birth till 21 years of age; the smaller number, as distinguished from the *majority*. MINOR KEY, in *music*, a key that takes a minor third; that arrangement of tones and semitones in a piece of music, often considered appropriate for solemn and mournful subjects (see MINOR in Music, below). MINOR CANONS, priests in certain of the cathedrals who rank next to the canons, and are responsible for the daily service. MINORITES, n. plu. *mīn'ōr-īts* [L. *Frātrēs minōrēs*, the Lesser Brothers]: a name of the Franciscan order of friars, which has left its trace in the popular designation of several places in English and other European cities. See FRANCISCANS. MINOR-PLAN'ET, n. in *astron.*, an asteroid, or planetoid.

MINOR: term used in music. 1. In the nomenclature of intervals. The interval between any note and another is named according to the number of degrees between them on the scale, both notes included. The interval between C and E is called a third; that between E and G also is a third; but these intervals are unequal, the one consisting of four semitones, the other of three; the former is therefore distinguished as a major, the latter as a minor interval. 2. M. is applied also to one of the two modes in which a musical passage may be composed, which is then said to be in the M. key. The scale of the M. mode differs from that of the major mode in the third of its key-note being a M. instead of a major third. See **MUSIC: MODE**, in Music.

MINOR BARONS: inferior class of barons, in England under the feudal system from the Conquest (1066) to near the close of the reign of Henry III. (about 1265), who held lands under military tenure not from the sovereign but from the principal barons. The word baron, in the earliest period of feudalism, signified one who held lands of a superior by military tenure. The superior might be the sovereign, or he might be an earl or other eminent person, who held of the sovereign. According as he was the sovereign on one hand, or an earl on the other, the baron holding under him was, in the earliest sense of the distinction, a greater or minor baron. At the Conquest, a large part of the soil of England was parcelled by William the Norman among his military retainers, who were bound in return to perform services, to do homage, and to assist in administering justice, and in transacting the other business done in the court of the king. 400 of these tenants-in-chief of the crown are enumerated in Domesday (q.v.), including among them 'vicecomites' and 'comites,' who together constituted the body of men called the Barons of England. As the sovereign was entitled to demand from the barons military service, homage, and attendance in the courts, so, many of the principal barons, particularly such of them as were earls, had military tenants, from whom they in turn received homage and assistance in administering justice in their baronial courts. These tenants were barons of the barons, or, in the earliest sense, minor barons; but by the usage of England, from the Conquest downward, they were seldom called barons, that term having been generally restricted to the former class, the holders of land direct from the crown, who were next to the king in dignity, formed his army and his legislative assembly, and obtained the Great Charter from King John. The subinfeudation which produced the minor barons was checked by a statute of Edward I., directing that all persons acquiring lands from a subject should hold, not of that subject, but of his superior.

Out of the 'commune concilium' of the king, at which all his barons were bound to attend, arose the parliament. It is not till the close of Henry III.'s, or beginning of Edward I.'s reign that we find a select number instead

of the whole barons attending. The exact period of the change, and the way in which it was made, are still among the obscure points of English history; it has been thought that after the rebellion which was crushed at the battle of Evesham, Henry III. summoned only those barons who were most devoted to his interest. From this period, a new distinction between major and minor barons arose, the latter term being no longer applied to the barons of the barons, but to those barons of the crown who were no longer summoned by writ to parliament. The word baron was more and more used in the restricted sense of a baron of parliament, and the right or duty of attendance came in process of time to be founded, not on the land tenure, but on the writ. See HENRY III.

In Scotland, the barons (or lairds) were such persons as held their lands directly of the crown. They were the king's advisers, witnessed his charters, and possessed a civil and criminal jurisdiction. All had to give attendance in the Scottish parliament, which consisted of the earls and barons sitting together. After the reign of James I., some of the more powerful barons appear more exclusively as lords of parliament, those whose incomes were below a certain amount obtaining a dispensation from attendance: yet all possessed a right to attend parliament till 1587, when the barons not specially created lords of parliament were required, in place of personally attending, to send representatives of their order from each sheriffdom. The term baron, however, still continued in Scotland to be applied to the whole body of tenants *in capite*, such of them as were lords of parliament being distinctively major, and the others minor barons; but all continuing till 1747 to possess extensive civil jurisdiction, and a criminal jurisdiction, from which only treason and the four pleas of the crown were excluded. The representative minor barons sat in the same house with the major barons, and until the union their votes continued to be recorded as those of the 'Small Barrounis.'

MINORCA, *mīn-awr'ka* or *mē-nōr'kâ*: largest of the Balearic Isles (q.v.), after Majorca, from which it is distant 25 m. n.east. It is 31 m. long, 13 m. in greatest breadth; 284 sq. m. Its coast, broken into numerous bays and inlets, is fringed with islets and shoals, and its surface, less mountainous than that of Majorca, is undulating, rising to its highest point in Mount Toro, 4,793 ft. above sea-level. Its productions are similar to those of Majorca, though it is neither so fertile in soil nor so well watered. The chief towns are Port Mahon (q.v.), and Ciudadela. The annual exports are worth \$550,000; imports, \$500,000. Pop. (1877) 34,173.

MINOS, *mī'nos*: name of two mythological kings of Crete. The first is said to have been the son of Jupiter and Europa, and brother of Rhadamanthus, and father of Deucalion and Ariadne, and, after his death, a judge in the infernal regions.—The second of the same name was

MINOTAUR—MINSK.

grandson of the former, and son of Lycastus and Ida. To him the celebrated *Laws of Minos* are ascribed, in which he is said to have received instruction from Jupiter. He was the husband of that Pasiphaë who gave birth to the Minotaur (q.v.).—Homer and Hesiod know of only one Minos, King of Cnossus, and son and friend of Jupiter.

MINOTAUR, n. *mīn'ō-tawr* [Gr. *minōtau'rōs*; L. *minotau'rus*—from *Minōs*, Minos; Gr. *tauros*, a bull]: in *anc. myth.*, a monster with the head of a bull and the body of a man; one of the most repulsive conceptions of early Grecian mythology. He is represented as the son of Pasiphaë and a bull for which she had conceived a passion. Minos (q.v.), the husband of Pasiphaë, shut him up in the Cnossian Labyrinth, and there fed him with youths and maidens, whom Athens was obliged to supply as an annual tribute, till Theseus, with the help of Ariadne (q.v.), slew the monster. The M. is, with some probability, regarded as a symbol of the Phœnician sun-god, Melkarth, with whose worship the bull-worship was cognate.

MINOT'S LEDGE LIGHT-HOUSE, *mī'nots*: noted structure on a projecting point of the Mass. coast, abt. 8 m. e.s.e. of Boston light, where the ledge of Cohasset is most dangerous to vessels coming into Boston harbor. The rock is $1\frac{1}{2}$ m. off shore, with barely a circle of 25 ft. uncovered at low tide. It was a ledge most difficult to build on. By an act of congress 1847, the first light-house was erected, with an octagon base, of which each side was $9\frac{1}{3}$ ft., and the distance across 25 ft. Iron piles of 10 in. diam. were set 5 ft. into the rock, at each angle of the octagon, and in the centre; and firmly braced and tied with wrought-iron braces. At 55 ft. above the rock the piles were fixed securely into a heavy casting, and above this was constructed the keeper's dwelling, surmounted by the light. The structure was finished 1849; and 1851, April, was destroyed by one of the worst storms ever known on that coast. By act of congress 1852, a plan, approved by the sec. of the treasury 1855, was adopted for a new structure, to be a granite tower, in the shape of the frustum of a cone. The base is 30 ft. in diam.; 40 ft. are built up solid, with the courses securely tied by galvanized wrought-iron dowels, 3 in. in diam., and the stones of each course dovetailed. From early in 1855 to the end of 1857 was consumed in preparing the rock and laying 4 stones. Six courses were laid 1858, and the solid 40 ft. completed 1859, with 20 ft. of the house above. It was finished, and the light in use, by the end of 1860.

MINSK, *mīnsk*: government and province of W. or White Russia, s.e. of Wilna; 34,860 sq. m. The people are chiefly Russians, Lithuanians, Poles, and Jews, with a small percentage of Tartars and gypsies. Five-sevenths of the population profess the Greek religion. The chief exports are timber, salt, and corn, brought by river-carriage to the Baltic and Black Sea ports. The principal manu-

factures are fine cloths, linen, and sugar. The soil is not fertile, and woods and marshes, with sandy wastes abound; but generally the native products suffice for the wants of the inhabitants. The climate is very severe in winter. Cattle and sheep breeding are carried on. The inhabitants of the s. or marshy portion of the province are subject to that dreadful disease, the *Plica Polonica* (q.v.).—Pop. (1886) 1,742,492; (1897) 2,156,123.

MINSK: chief town of the govt. of M.; on the Svislocz, an affluent of the Beresina, 465 m. by rail w. of Moscow. It is built mostly of wood, but has many handsome stone edifices, among which are the Greek and Rom. Cath. cathedrals and seminaries, the church of St. Catharine, a number of educational and philanthropic establishments, a public library, and a theatre. The chief manufactures are woolen cloth and leather. Pop. (1880) 44,000, one-third of whom are Jews; (1897) 91,494.

MINSTER, n. *mĭn'stĕr* [AS. *mynstre*; OF. *monstier*—from mid. L. *monastĕrĭum*, a monastery, then the church attached to it]: the church of a monastery or convent; a cathedral church: see MONASTERY.

MINSTREL, n. *mĭn'strĕl* [OF. *menestrel*, a workman, a minstrel—from mid. L. *ministrālis*, an artisan, a servant—from mid. L. *ministĕrĭum*; F. *ministère*, occupation, an art]: in the *middle ages*, one of a body of men whose profession it was to administer their skill in poetry and music by recounting heroic deeds in verse, often composed by themselves, and to sing them to the harp; a national poet who writes poetry recounting the heroic deeds of the past; a portrayer in verse of national deeds and character, and of home life in the past; a musician. **MINSTRELSY**, n. *mĭn'strĕl-sĭ*, the art or occupation of a minstrel; system of ballads restricted to certain events, or to a certain age; music, generally instrumental; a number of musicians.—*Minstrels*, usually strollers, often accompanying their song with mimicry and gesture, were exceedingly popular, supplying a rude entertainment suited to the taste of the times. No scene of festivity was complete without them. Some great personages had many of them in their retinue. Their songs were mostly martial, tending to cultivate a heroic spirit accordant with the chivalry of the middle ages. In general, they corresponded in England to the earlier Bards (q.v.) of Wales, Ireland, and Scotland, though as a class much inferior. In the reign of Richard I. they were at their height of privilege: the king, himself a minstrel, gathered them in numbers to his court, with Troubadours (q.v.) from France, and gave them honors and rewards. From the time of Edward IV., the order declined, and in the time of Elizabeth, minstrels were by law classed with jugglers, wandering tinkers, and pedlers, as vagabonds and beggars. Increasing refinement had made such ancient and rude pastime distasteful. Of far higher grade were the Troubadours (q.v.) and Trouvères (q.v.), who sang mostly of love, and in other respects differed from the minstrels.

MINT, *n.* *mĭnt* [Dut. *munte*; Ger. *münze*—from L. *monētā*, money, the stamp with which it was struck: Dut. *muntēn*, to mint, to strike money]: place where money is coined by authority of government: figuratively, a source of abundant supply; a place in which something is invented: *V.* to coin; to invent or fabricate. **MINT'ING**, *imp.* **MINT'ED**, *pp.* coined. **MINTAGE**, *n.* *mĭnt'āj*, that which is coined or stamped; duty paid for coining. *Note.*—*Moneta* is said to have been a surname of Juno, in whose temple at Rome money was coined—from L. *monērē*, to warn, to admonish, *Monēta* thus denoting the warning one, probably because the inscription thereon warned or brought to remembrance—see Skeat.

MINT: establishment for making coins or metallic money (see **MONEY**). For the early history of the art, see **NUMISMATICS**.

The earliest regulations regarding the English *M.* belong to Anglo-Saxon times. An officer called a reeve is referred to in the laws of Canute as having some jurisdiction over it, and certain names which, in addition to that of the sovereign, appear on the Anglo-Saxon coins, seem to have been those of the moneyers, or principal officers of the *M.*, till recently, an important class of functionaries, responsible for the integrity of the coin. Besides the sovereign, barons, bishops, and the greater monasteries had their respective mints, where they exercised the right of coinage, a privilege enjoyed by the abps. of Canterbury as late as the reign of Henry VIII., and by Wolsey as Bp. of Durham, and Archbishop of York.

After the Norman Conquest, the officers of the royal *M.* became to a certain extent subject to the authority of the exchequer. Both in Saxon and in Norman times, there existed, under control of the principal *M.* in London, a number of provincial mints in different towns of England; there were no fewer than 38 in the time of Ethelred, and the last of them was discontinued in the reign of William III. The officers of the *M.* were formed into a corporation by a charter of Edward II.; they consisted of the warden, master, comptroller, assay-master, workers, coiners, and subordinates.

The seignorage for coining at one time formed a considerable item in the revenues of the crown. It was a deduction made from the bullion coined, and comprehended both a charge for defraying the expense of coinage, and the sovereign's profit in virtue of his prerogative. In the reign of Henry VI., the seignorage amounted to 6*d.* in the pound; in the reign of Edward I., 1*s.* 2½*d.* By 18 Car. II. c. 5, the seignorage on gold was abolished, and has never since been exacted. The shere, or remedy, as it is now called, was an allowance for the unavoidable imperfection of the coin.

The function of the *M.* is in theory to receive gold in ingots from individuals, and return an equal weight in coin; but, in fact, gold is now coined in Britain for the

Bank of England exclusively; for, though any one has still the right to coin gold at the M., the merchant or dealer has ceased to obtain any profit for so doing, as the bank is compelled to purchase all gold tendered to it at the fixed price of £3, 17s. 9d. an ounce. The increment on the Assay (q.v.), or on the fineness of the metal, which augments the standard weight, and therefore the value of the gold, is a more considerable source of profit to the importer of gold. The ordinary trade assay, on which the importer purchases the bullion, does not by usage come closer than $\frac{1}{8}$ of a carat grain or $7\frac{1}{2}$ grains per lb. troy. Before being coined, the gold is subjected to a second and more delicate assay at the M., and the importer receives the benefit of the difference, amounting to about $\frac{1}{16}$ of a carat grain = $3\frac{3}{4}$ troy grains, or nearly 8d. per lb. weight.

Silver, formerly, concurrently with gold, a legal tender to any amount, ceased to be so in the reign of George III. There is a seignorage on both silver and copper money, amounting in silver to 10 per cent., when the price of silver is 5s. per ounce, which, however, from the tear and wear of the coin, brings small profit to the crown. On the copper coinage, the seignorage is no less than 100 per cent. on the average price of copper. The profits of the seignorage, formerly retained by the master of the M., to defray the expense of coinage, have, since 1837, been paid into the bank, to the credit of the consolidated fund.—The operative department of the British M. was re-arranged 1881,2, with new and improved machinery. Mints have lately been established at Sydney and Melbourne to coin the large gold product of Australia.

Processes of coining.—Till the middle of the 16th c., little improvement seems to have been made in the art of coining from the time of its invention. The metal was simply hammered into slips, which were afterward cut into squares of one size, and then forged round. The required impression was given to these by placing them in turn between two dies, and striking them with a hammer. As it was not easy by this method to place the dies exactly above each other, or to apply proper force, coins so made were always faulty, and had the edges unfinished, which rendered them liable to be clipped. A minor improvement consisted in the introduction of a species of tongs, holding both dies, one die at the extremity of each limb, thus securing good registration and avoiding the necessity of readjustment after every blow. The first great step was the application of the screw, invented 1553 by Brucher, French engraver. The plan, expensive at first, did not, till 1662, altogether supersede the hammer in the English M. The chief steps in coining as now practiced are as follows: The gold or silver is sent to the M. in the form of *ingots* (Ger. *eingiessen*, Dut. *ingieten*, to pour in, to cast), or castings; those of gold weighing each about 180 oz., while the silver ingots are much larger. Before melting, each ingot is tested as to its purity by Assaying (see ASSAY), and then weighed, and the re-

sults recorded. For melting the gold, pots or crucibles of plumbago are used, made to contain each about 1,200 oz. The pots being heated white, in furnaces, the charge of gold is introduced with the proper amount of copper (depending on the state of purity of the gold as ascertained by the assay), to bring it to the standard, which is 22 parts of pure gold to 2 of copper (see ALLOY). The metal when melted is poured into iron molds, which form it into bars 21 inches long, $1\frac{3}{4}$ inch broad, and 1 inch thick, if for sovereigns; and somewhat narrower, if for half-sovereigns. For melting silver (the alloy of which is adjusted to the standard of 222 parts of silver to 18 of copper), malleable iron pots are used, and the metal is cast into bars similar to those of gold. The new copper, or rather bronze coinage, issued 1860, is an alloy of 95 parts of copper, 4 of tin, and 1 of zinc. The coins are of about only half the weight of their old copper representatives. The processes of casting and coining the bronze are essentially the same as for gold and silver.

The operation of *rolling* follows that of casting. It consists in repeatedly passing the bars between pairs of rollers with hardened steel surfaces, driven by steam-power; the rollers being brought closer and closer as the thickness becomes reduced. At a certain stage, as the bars become longer, they are cut into several lengths; and to remove the hardness induced by the pressure, they are annealed. The finishing rollers are so exquisitely adjusted that the *fillets* (as the thinned bars are called) do not vary in thickness in any part more than the ten-thousandth part of an inch. The slips are in some cases for sovereigns and half-sovereigns still further reduced in the British M. at what is called the 'draw-bench,' or 'drag-bench,' where they are drawn between steel dies, as in wire-drawing, and are then exactly of the necessary thickness for the coin intended. The fillets thus prepared are passed to the tryer, who, with a hand-punch, cuts a trial-blank from each, and weighs it in a balance; and if it vary more than $\frac{1}{8}$ of a grain, the whole fillet is rejected.

For cutting out the *blanks* of which the coins are to be made, there were formerly in the British M. 12 presses arranged in a circle, so that one wheel with driving cams, placed in the centre, worked the whole. The punches descended by pneumatic pressure, and the fillets were fed into the presses by boys, each punch cutting out about 60 blanks a minute. At present a simpler press is used, one for each fillet. By an eccentric a block carrying from one to five punches is forced down. The punches as they descend enter holes in the base plate. The fillets are drawn by rollers under the punches, by which the blanks are forced out. The scrap left after the blanks are cut out, called *scissel*, is sent back to be remelted. Formerly the blanks were weighed, but at present in the London M. the finished coin is afterward weighed by the automatic balance—a beautiful and most accurate instrument, invented about 1854, and subsequently improved. It weighs 23 blanks

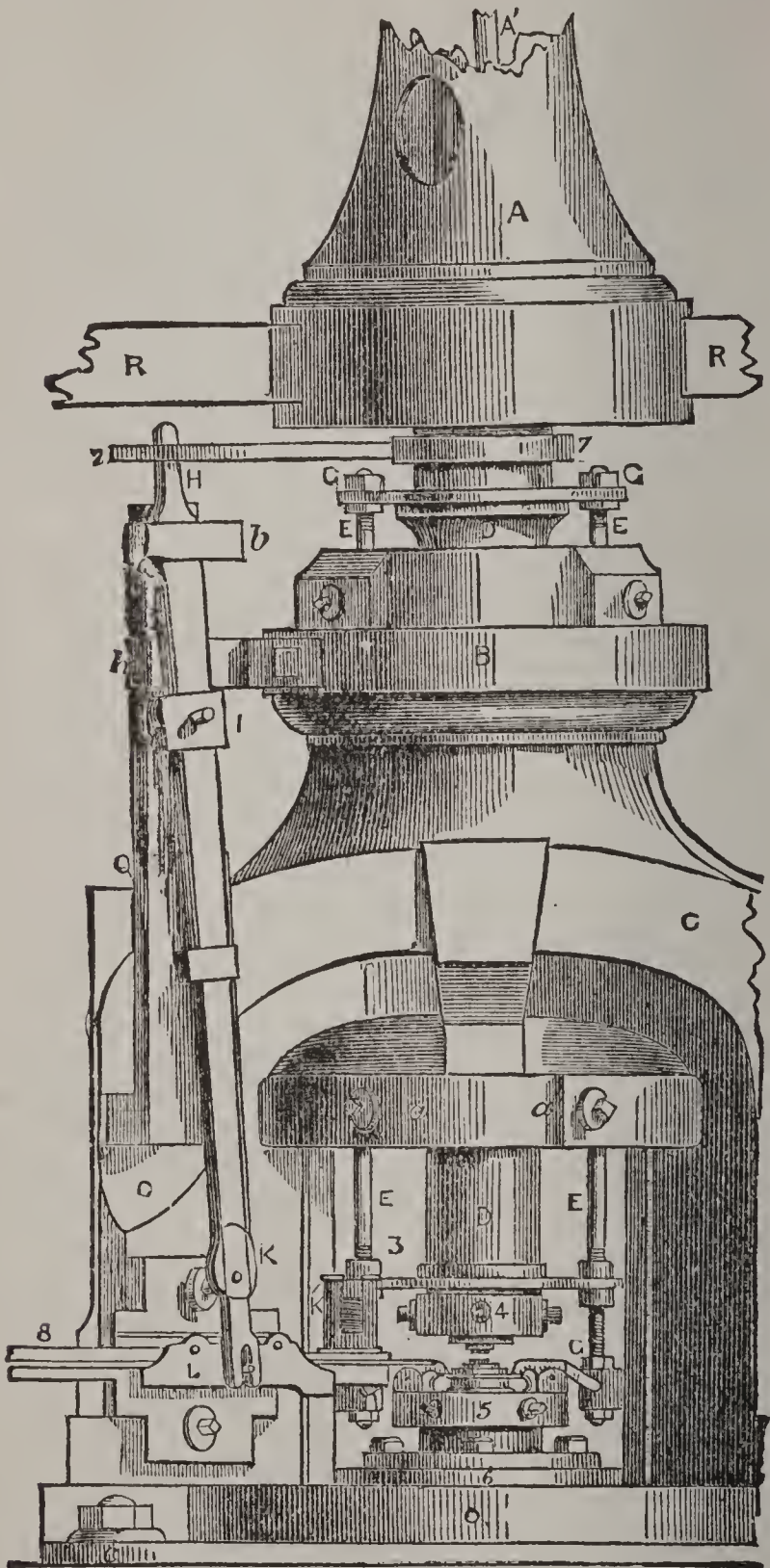
per minute, and each to the 0·01 of a grain. The standard weight of a sovereign is 123·274 grains, but the M. can issue them above or below this to the extent of one-fifth of a grain, which is called *the remedy*. Pieces which come within this limit are dropped by the machine into a 'medium' box, and pass on to be coined. Those below or above the required weight are pushed into other boxes to be remelted.

To insure their being properly milled on the edge, the blanks are pressed edgeways in a machine between two circular steel-plates, which raises the edges, and at the same time secures their being perfectly round. After this they are annealed to soften them, before they can be struck with dies; they are also put into a boiling pot of dilute sulphuric acid, to remove any oxide of copper from the surface. Subsequently, they are washed with water, and dried with great care in hot sawdust, and finally in an oven at a temperature slightly above boiling water. Without these precautions, the beautiful bloom on new coin could not be secured.

In the press-room, the blanks receive the impression which makes them perfect coins. The coining-press formerly used in the London M. and still in use in other mints, is shown in the fig. It is placed upon a strong foundation of masonry. CCB is the massive iron frame into which the screw D works, the upper part B being perforated to receive it. On the bottom of this screw the upper steel die is fixed by a box, the lower die being fixed in another box attached to the base of the press. The dies have, of course, the obverse and reverse of the coin upon them: see DIE-SINKING. The blank coin is placed on the lower die, and receives the impression when the screw is turned round so as to press the two dies forcibly toward each other. A steel ring or collar contains the coin while it is being stamped, which preserves its circular form, and also effects the milling on the edge. In cases where letters are put on the edge of a coin, a collar divided into segments working on centrepins, is used. On the proper pressure being applied, the segments close round, and impress the letters on the edge of the coin.

The screw of the press is put in motion by means of the piece A, worked by machinery driven by steam-power, and situated in an apartment above the coining-room. The steam-engine exhausts an air-chamber, and from the vacuum produced, an air-engine works a series of air-pumps, which communicate a more exact and regular motion to the machinery of the stamping-presses than by the ordinary condensing engine. The loaded arms RR strike against blocks of wood, whereby they are prevented from moving too far, so as to run the risk of breaking the hard steel dies by bringing them in contact. The press brings down the die on the coin with a twisting motion, but if it were to rise up in the same way, it would abrade the coin; there is, in consequence, an arrangement which, by means of a wide notch in the ring

3, allows the die to be raised up a certain distance before it begins to turn round with the screw. On the left side of the figure, the arrangement for feeding the blanks and removing the coins as they are stamped, is shown. A



Coining-press.

lever HIK, moving on a fulcrum I, is supported by a bar Q, fixed to the side of the press. The top of this lever is guided by a sector 7 fixed upon the screw D. In this sector there is a spiral groove, which, as the screw turns

round, moves the end H of the lever to or from the screw, the other end K being moved at the same time either toward or away from the centre of the press. The lower end of the lever moves a slider L, directed exactly to the centre of the press, and on a level with the upper surface of the die. The slider is a thin steel-plate in two pieces united by a joint, and having a circular cavity at the end, which, when its limbs are shut, grasps a piece of coin by the edge. This piece drops out on the limbs separating. There is a tube at K which an attendant keeps filled with blank pieces; it is open at the bottom, so that the pieces rest on the slider. When the press is screwed down, the slider is drawn back to its furthest extent, and its circular end comes exactly beneath the tube. A blank piece of coin now drops in, and is carried, when the screw rises, to the collar which fits over the lower die. The slider then returns for another blank, while the upper die descends to give the impression to the coin. Each time the slider brings a new blank to the die, it at the same time pushes off the piece last struck. An arrangement of springs lifts the milled collar to inclose the coin while it is being struck.

In the newly-arranged London M. the Uhlhorn lever press, modified by R. Heaton & Sons, of Birmingham, has been introduced, and 14 are in use. It works upon the elbow-joint principle, resembling somewhat the Thonnelier press in use in the United States. For the best results about 90 coins per minute are produced.

It is found on examining the coins that about 1 in 200 is imperfectly finished; these being rejected, the rest are finally weighed into bags, and subjected to the process of *pixing*. This consists in taking from each bag a certain number of sovereigns or other coins, and subjecting them to a final examination by weight and assay, before they are delivered to the public.

United States.—The first M. was established at Philadelphia, by act of congress 1792, April 2, and the first coins issued by govt. authority were copper cents, 1793. The following year silver dollars were made; gold eagles were coined 1795. No steam-power was used in the M. till 1816. In 1835 branch mints were established in New Orleans, Charlotte (N. C.), and Dahlonega (Ga.); in 1854 San Francisco; in 1870 Carson City (Nev.). In 1854 an assay office was established in New York; in 1864 Denver (Colo.), in 1872 Boise City (Ida.). 1873, April 1, a new law went into force under which the entire service was reorganized. The mints and assay offices were made a bureau of the treasury department, and brought under the general superintendence of the chief officer of the bureau, termed the director of the mint, appointed by the president for a term of five years with consent of the senate, and removable for cause. Each M. has as officers a supt., assayer, melter and refiner, and coiner, and an engraver is stationed at the Philadelphia M. The official force of each assay office consists of an assayer and a melter, and the New York office has also a supt.

The gold coins of the United States are the double eagle, eagle, half-eagle, three-dollar, quarter-eagle, and dollar. Silver coins are the standard dollar, half-dollar, quarter-dollar, and dime: the trade dollar (420 grs.) is no longer coined here. Although the appliances are remarkably perfect and the greatest care is used to secure uniformity, the coins of the same denomination are liable to vary slightly in fineness and weight. To arrange for this the law allows a deviation in fineness of gold coins of $\frac{1}{1000}$, and of $\frac{3}{1000}$ in silver coins, though so much departure from the standard seldom or never occurs.

The gold coin of the United States is alloyed with $\frac{1}{10}$ its weight of an alloy of copper and silver, of which alloy not more than one-half is allowed to be silver. In practice very little silver is used. The silver coin is alloyed with $\frac{1}{10}$ its weight of copper. The general coining operations resemble those already described. (See ALLOY, or ALLAY: ASSAY.) The metal is received in ingots about 12 inches long, half an inch thick, and from three-quarters of an inch to two and one-half inches wide, tapered at one end like a chisel. These are rolled with intermediate annealings, and drawn in a draw-bench as described for the English M., and the blanks or 'planchets' are cut out by an eccentric stamping press. The weighing of the planchets is done by hand, women being employed for this service, who attain extraordinary dexterity. Milling is next executed in a machine of American invention, the coin being rolled horizontally through a channel slightly diminishing in width, by which its edge is upset and the circular rim forced up around its edge. The coining press used is the French lever press invented by Thonnellier, which works on the well-known elbow-joint principle. The milled blanks are placed in a vertical tube, from which the bottom one is automatically withdrawn by the mechanism and placed between the dies. The impress is given and the edge fluted at one operation. The dies are engraved by hand. The original ones are never used for coining. By repeated blows in a heavy screw press an impression of them is produced in soft steel. This is then hardened, and from it a second die is obtained, also in soft steel, which, after hardening, is used for the actual work of coining. All the assaying processes and methods for the recovery of waste have been brought to the highest perfection. In weight in the single gold pieces the deviation must not exceed, for the double eagle and eagle, $\frac{1}{2}$ grain; for the half-eagle, three-dollar piece, quarter-eagle, and one-dollar piece, $\frac{1}{4}$ grain. In bulk more than $\frac{1}{100}$ oz. deviation is not allowed in \$5,000 of double eagles down to quarter-eagles, or in \$3,000 of three-dollar pieces, or in \$1,000 of one-dollar pieces. In the silver dollar, half-dollar, quarter-dollar pieces, and dime, $1\frac{1}{2}$ grain deviation only is allowed; in bulk $\frac{2}{100}$ of an oz. in 1,000 dollar, half-dollar, or quarter-dollar pieces, and $\frac{1}{100}$ oz. in 1,000 dimes. Special rates exist for the minor coins.

MINT.

MINT, n. *mīnt* [AS. *mynte*; L. *mentha*; Gr. *minthē*, mint], (*Mentha*): genus of plants, of nat. order *Labiatae*; with small, funnel-shaped, 4-fid, generally red corolla, and four straight stamens. The species are perennial herbaceous plants, varying considerably in appearance, but all with creeping root-stocks. The flowers are whorled, the whorls often grouped in spikes or heads. The species are widely distributed over the world. WATER M. (*M. aquatica*), grows in wet grounds and ditches. CORN M. (*M. arvensis*), is a weed in cornfields and gardens. These and most of the other species have erect stems. All the species contain an aromatic essential oil, in virtue of which they are more or less medicinal. The most important species are SPEARMINT, PEPPERMINT, and PENNYROYAL.—SPEARMINT or GREEN M. (*M. viridis*) is a native of almost all temperate parts of the globe; it has erect smooth stems, one to two ft. high, with whorls of flowers in loose cylindrical or oblong spikes at the top; leaves lanceolate, acute, smooth, serrated, destitute of stalk, or nearly so. It has a very agreeable odor.—PEPPERMINT (*M. piperita*), a plant of equally wide distribution in temperate parts of the world, is very similar to spearmint, but has the leaves stalked, and the flowers in short spikes, the lower whorls somewhat distant from the rest: it is readily recognized by the peculiar pungency of its odor and of its taste.—PENNYROYAL (*M. pulegium*) unlike the Amer. plant, has a much-branched prostrate stem, which sends down new roots as it extends in length; the leaves ovate, stalked; the flowers in distant globose whorls. Its smell resembles that of the other mints.—All these species, in a wild state, grow in ditches or wet places. All are cultivated in gardens; and peppermint largely for medicinal use and for flavoring lozenges. *Mint Sauce* is generally made of spearmint; which is used also for flavoring soups, etc. A kind of M. with lemon-scented leaves, called BERGAMOT M. (*M. citrata*), is found in parts of Europe, and elsewhere, and is cultivated in gardens. Varieties of peppermint and horse-mint (*M. sylvestris*), with *crisped* or inflato-rugose leaves, are much cultivated in Germany under the name CURLED M. (*Krause-minze*); the leaves being dried and used as a domestic medicine, and in poultices and baths. All kinds of M. are easily propagated by parting the roots or by cuttings. Most of them bloom in Aug.—Of different genera are *Monarda punctata*, also called Horse-M., and *Pycnanthemum linifolium*, also called Mountain-M.; also *Nipata Cataria*, Cat-M. or CATNIP (q.v.). It is said that mice have great aversion to M., and that a few leaves of it will keep them at a distance.

Peppermint, Pennyroyal, and Spearmint, are used in medicine. The pharmacopœias contain an *aqua*, *spiritus*, and *oleum* of each of them; the officinal part being the herb, which should be collected when in flower. *Peppermint* is a powerful diffusible stimulant, and, as such, is antispasmodic and stomachic, and is much employed in the treatment of gastrodynia and flatulent colic. It is

MINTURN—MINUIT.

extensively used also in mixtures, for covering the taste of drugs. *Penny-royal* and *spearmint* are similar in their action, but inferior for all purposes to peppermint. The ordinary doses are one to two ounces of the *aqua*, a drachm of the *spiritus* (in a wine-glassful of water), and three to five drops of the *oleum* (on a lump of sugar).

MINTURN, *mĭn'tĕrn*, ROBERT BOWNE: 1805, Nov. 16—1866, Jan. 9; b. New York. At the age of 14 he entered a counting-house, but applied his spare moments to literary studies. In 1825 he formed a partnership with Charles Green; in 1830 he became a member of the firm of Fish & Grinnell, afterward Grinnell, Minturn & Co., which under his lead became one of the principal houses in the shipping line in the world. He was one of the founders of St. Luke's Hospital, and was identified with many other charitable enterprises. Upon the organization of the Union League Club he was chosen its pres., and held the office until his death in New York.

MINUEND, n. *mĭn'ū-ĕnd* [L. *minuend'us*, to be diminished—from *minŭō*, I lessen]: in *arith.*, the number that is to be lessened; the number from which another is to be subtracted.

MINUET, n. *mĭn'ū-ĕt* [F. *menuet*, a dance—from *menu*, small—from L. *minŭtus*, small]: a slow graceful dance—so named from the short steps in it; also the tune or air for it. The M. was originally from Poitou, France: its music is said to have been composed by Lully the Elder, and it was danced by Louis XIV. 1653 at Versailles with his mistress. The music of the M. is in $\frac{3}{4}$ time, and is still well known by the celebrated *Minuet de la Cour*, introduced in stage performances.

MINUIT, *mĭn'u-ĭt* (or MIN'UITS, or MIN'NEWIT), PETER: 1580–1641: colonial governor: b. Wesel, Rhenish Prussia. He was a deacon in the Walloon Chh.; removed to Holland; and, some years later, was appointed director for the Dutch W. India Co. at New Netherlands in Amer., in succession to William Van Huist, but with such enlarged powers as made him the first real governor. He landed on Manhattan I., 1626, May 4, and bought it of the Indians for goods of the value of \$24. Sending to Holland a ship-load of skins and timber, with the news of his purchase of colony land, he built Fort Amsterdam; also a mill and warehouse; and, with new arrivals, had under him a colony of 300, which he governed with vigor and discretion. In 1627 he established commercial relations with the Plymouth colony, through a correspondence with Gov. Bradford. Abuses, leading to formation of the great patroon estates, caused his recall, 1631, Aug.; and he sailed for Holland 1632, March. Putting into Plymouth, Eng., he was detained on a charge of illegal trading on Eng. colonial ground, but, after diplomatic correspondence, was allowed to proceed, May 27. Not succeeding in Holland, in regaining credit and recovering his office, he went to Sweden 1637, and was engaged by the chancellor, Oxenstiern, to go out under the Sw.

W. India Co. M. sailed from Gothenburg 1637, with a body of Sw. and Finn. colonists, in two vessels, and coming into Delaware Bay, bought of the Indians the land between the s. cape and the falls near Trenton. In 1638, Mar., he undertook the erection of Fort Christiana, near the present site of Wilmington. In spite of vigorous Dutch protests and Indian dangers, and although, in 1640, from failure of provisions, the colony would have taken refuge with the Dutch at Manhattan I., if supplies had not arrived the day before the intended move, the New Sweden, as it was called, under M., proved successful, and was the first permanent European settlement of Delaware. M.'s death, however, near Fort Christiana, was followed, 14 years later, by Dutch aggression and annexation, 1655.

MINUS, n. *mī'nūs* [L. *minus*, less]: in *arith.*, and *alg.*, the sign of subtraction, thus [—], which, placed between two quantities, means that the latter is to be subtracted from the former.

MINUSCULE, n. *mī-nūs'kūl*, or MINUS'CULA [L. *minusculus*, very small—from *minus*, less]: minute kind of letter or character used in the mediæval mss.

MINUTE, a. *mī-nūt'* [L. *minūtus*, little, small—from *minūō*, I make less: It. *minuto*, slender: F. *menu*, small]: extremely small or slender; little; diminutive; attentive to small things; exact in details. MINUTELY, ad. *mī-nūt'li*, in exact details. MINUTE'NESS, n. *-nēs*, smallness; slenderness; great exactness.—SYN. of 'minute': fine; exact; critical; circumstantial; particular; small; slender; slight; detailed.

MINUTE, n. *mīn'it* [F. *minute*, a minute—from mid. L. *minūtā*, small in space or time: L. *minūtim*, in little pieces or morsels—from *minūō*, I lessen: It. *minuto*, a minute]: small portion of time or duration; 60th part of an hour; 60th part of a degree (see SEXAGESIMAL ARITHMETIC): in *arch.*, 60th part of the diameter of the shaft of a classic column, measured at the base—used as a measure to determine the proportions of the order; a short sketch or note of an agreement, fact, or event; an outline or brief report in writing of the proceedings of any meeting or society or of the purport of any instrument; so called from being taken down shortly and in *minute* or small writing, to be afterward engrossed (see ENGROSS).—MINUTE, in *law*, is a memorandum or record of some act of a court or of parties; in the latter sense, it is used chiefly in Scotland, as in the case of minute of agreement, minute of sale, etc.: V. to put down in writing an outline of the proceedings of a meeting or society. MIN'UTING, imp. MINUTED, pp. *mīn'it-ēd*. MINUTELY, ad. *mīn'it-li*, happening every minute; in detail. MINUTE-BOOK, the book in which the minutes are written. MINUTE-GLASS, a small sand-glass. MINUTE-GUNS, guns fired at short intervals, as signals of distress at sea, or of mourning. MINUTE-HAND, the hand of a clock or watch pointing out the minutes.

MINUTIA—MIOHIPPIUS.

MINUTIA, n. *mī-nū'shī-ă*, MINU'TIÆ, n. plu. *-shī-ē* [L. *minūtīā*, smallness, fineness—from *minūtūs*, little, small: F. *minutie*, a trifle]: the smaller particulars or details.

MINX, n. *māngks* [contracted from MINIKIN, which see: comp. Gael. *mineag*, a gentle female]: a word of endearment; but generally, a pert, proud girl; a pert, wanton girl; a mink, which see.

MINY: see under MINE, an excavation.

MIOCENE, n. *mī'ō-sēn* [Gr. *meion*, less; *kainos*, recent]: in *geol.*, term introduced by Lyell to characterize the Middle Tertiary strata, which he supposes to contain a smaller proportion of recent species of mollusca than the newer Pliocene, and more than the older Eocene. For an account of the American M., see TERTIARY. Here only the foreign is noticed.

Strata of this age occur in Britain in two limited and far separated localities—in the island of Mull, and at Dartmoor in s.e. England. In this last district, they exist at Bovey Tracey, in a flat area ten m. long by two m. broad, and consist of clay interstratified with beds of imperfect lignites. Pengelly and Heer have recently examined the strata of this small basin, and have found that all the plants are of Miocene age, and belong to the same species as those found in similar deposits, in continental Europe, Iceland, Greenland, and Arctic America. Their *facies* indicates a warmer climate than the present, and the geographical range of the species is unexampled in the existing flora. The Greenland M. presents a difficult problem, with its remains of vegetation of great luxuriance within 8° 15' of the n. pole, where now the land is almost continuously covered with snow and ice, and the winter night extends through half the year. The Mull beds are at the headland of Ardtun, and consist of interstratified basalts, ashes, and lignites: there are three leaf-beds, varying in thickness from 1½ to 2½ ft., separated by two beds of ash, the whole resting on, and covered by strata of basalt, and the whole thickness is 131 ft. It is supposed that the leaf-beds were deposited in a shallow lake or marsh, in the vicinity of an active volcano. One of the beds consists of a mass of compressed leaves without stems, and accompanied with abundant remains of an equisetum, which grew in the marsh into which the leaves were blown. The leaves belong to dicotyledons and coniferæ, and are species similar to those of Bovey Tracey.

The Fahluns of France are of this age, as are also part of the Mollassi of Switzerland and the Mayence and Vienna basins. Of the same period are the highly fossiliferous deposits in the Sewalik Hills, India, containing the remains of several elephants, a mammoth, hippopotamus, giraffe, and large ostrich, besides several carnivora, monkeys, and crocodiles, and a large tortoise, whose shell measured 20 ft. across. The European beds contain the remains of the *Dinotherium* (q.v.).

MIOHIPPIUS: see HORSE, FOSSIL.

MIÖSEN—MIRABEAU.

MIÖSEN, *mē-ō'zén*: lake in Norway, 36 m. by rail n.e. of Christiania; expansion of the river Lougen: length 56 m., greatest breadth 12 m. The scenery is beautiful, and the air invigorating. The lake is a favorite resort in summer.

MIOSTEMONOUS, a. *mī'ō-stēm'ō-nūs* [Gr. *meiōn*, less; *stēmōn*, a stamen]: in *bot.*, applied to a flower in which the stamens are neither equal to, nor a multiple of, the floral envelopes.

MIR, n. *mēr* [Rus.]: a communal division in Russia.

MIRABEAU, *mīr'a-bō*, F. *mē-râ-bō'*, **HONORÉ GABRIEL RIQUETI**, Comte DE: one of the greatest of French statesmen and orators: 1749, Mar. 9—1791, Apr. 2; b. Bignon, near Nemours; son of Victor Riqueti, Marquis de M. (1715–89). M. was descended, by his own account, from the ancient Florentine family of Arrighetti, who being expelled from their native city in 1268, on account of Ghibelline politics, settled in Provence. Jean de Riqueti or Arrighetti purchased the estate of Mirabeau 1562; his grandson, Thomas, happened to entertain here, in 1660, Louis XIV. and Cardinal Mazarin, on which occasion he received from the monarch the title of Marquis Victor Riqueti. The family had acquired wealth in mercantile business at Marseille. M.'s father was a vain and foolish man, wasted his patrimony, wrote books of philanthropy and philosophy, e.g., *L'Ami des Hommes* (5 vols. Par. 1755), and was overbearing in his own house: he procured no fewer than 54 *lettres de cachet* at different times against his wife and his children. M., the eldest son, was endowed with an athletic frame and extraordinary mental abilities, but was of a fiery temper, and disposed to excess. He became lieut. in a cavalry regiment; but continued to prosecute various branches of study with great eagerness, while out-running his companions in a succession of disgraceful *liaisons*. An intrigue with the youthful wife of an aged marquis brought him into danger, and he fled with her to Switzerland, and thence to Holland, where he subsisted by his pen, among other productions of which, his *Essai sur le Despotisme* attracted great attention. Meanwhile, sentence of death was pronounced against him; and the French minister, at his father's instigation, demanding that he should be delivered up to justice, he and his paramour were apprehended at Amsterdam, and he was brought to the dungeon at Vincennes, and there closely imprisoned for 42 months. During this time he was often in great want, but employed himself in literary labors, writing an *Essai sur les Lettres de Cachet et les Prisons d'état*, published at Hamburg (2 vols. 1782), and a number of obscene tales, by which he disgraced his genius, though their sale supplied his necessities. After his liberation from prison, he subsisted chiefly by literary labor, and still led a very profligate life. He wrote many effective political pamphlets, particularly against the financial administration of Calonne,

receiving pecuniary assistance, it was said, from some of the great bankers of Paris; and became one of the leaders of the liberal party. When the states-general were convened, he sought to be elected as a representative of the nobles of Provence, but was rejected by them on the ground of his want of property; and left them with the threat that, like Marius, he would overthrow the aristocracy. At about this time Count M. seems to have begun to see the miserable folly of his wild and reckless youth, and to have sought to bring himself under at least some degree of control. Though it has been common to accuse him of every kind of vice, the evidence points to excesses in only one direction—though in that direction frightful and disgraceful, and undoubtedly the cause of his early death. In his more sober years, his better nature developed; and a virtue rare in that land at that time was manifested in M.—the virtue of political morality. His opinions were not for sale, though he supported himself by literary work. He purchased a draper's shop, offered himself as a candidate to the third estate, and was enthusiastically returned both at Aix and Marscille. He chose to represent Marscille, and by his talents and admirable oratorical powers soon acquired great influence in the states-general and national assembly. Barnave well characterized him as 'the Shakespeare of eloquence.' M. was characterized by large historical knowledge, logical force, and passionate enthusiasm. With his oratorical gifts, he united a singularly calm and balanced judgment in public affairs. He stood forth as the opponent of the court and of the aristocracy, but regarded the country as by no means ripe for the extreme changes proposed by political theorists, and labored, not for the overthrow of the monarchy, but for the abolition of despotism, and the establishment of a constitutional throne. To suppress insurrection, he effected, 1789, July 8, the institution of the national guard. In some of the contests which followed, he sacrificed his popularity to maintain the throne. As anarchy and revolutionary frenzy increased, the more decided did he become in resistance to their progress; but it was not easy to maintain the cause of constitutional liberty at once against the supporters of the ancient despotism and the extreme revolutionists. The king and his friends were long unwilling to enter into any relations with one so disreputable, but at last, under the pressure of necessity; it was resolved that M. should be invited to become minister. No sooner was this known, than a combination of the most opposite parties, by a decree 1789, Nov. 7, forbade the appointment of a deputy as minister. From this time, M., who never turned back from any course because of the number and power of the adversaries, strove in vain in favor of the most indispensable prerogatives of the crown, and in so doing exposed himself to popular indignation. He still continued the struggle, however, with wonderful ability, and sought to reconcile

the court and the Revolution. If the king and the people could have moved in the direction vigorously urged by M., the French Revolution would not have been the name of horror which it is on the page of history. In 1790, Dec., he was elected pres. of the Club of the Jacobins, and 1791, Feb., of the national assembly. Both in the club and in the assembly he showed great boldness and energy; but soon after his appointment as pres. of the latter, he sank into a state of bodily and mental weakness, consequent on his great exertions and his youthful debaucheries, and died in a few weeks. He was interred with great pomp in the church of Saint Genevieve, the 'Pantheon;' but his body was afterward removed to make room for that of Marat. A complete ed. of his works was published at Paris, 9 vols. 1825-27. His natural son, Lucas Montigny, published *Mémoires Biographiques, Littéraires et Politiques de Mirabeau* (2d ed. 8 vols. Par. 1841), the most complete account which we have of his life. See also Carlyle's sketch of M. in *Miscellaneous Essays*, and *French Revolution*. The *Life of Sir Samuel Romilly* presents Count M.'s character in a far more favorable light than has been familiar to the popular thought. Romilly, one of the purest of men, was M.'s intimate friend during his stay in England; and while not blind to his blemishes of character, and noting as one of his slighter faults his excessive vanity, records his conviction that 'great injustice has been done him;' and that in his public conduct 'he was desirous of doing good, that his ambition was of the noblest kind, and that he proposed to himself the noblest ends.' The acceptance of this judgment of charity leaves the impression still of a wrecked life.

MIRABILITE, n. *mī-rāb'ī-līt* [L. *mīrab'īlis*, wonderful]: a name given to sulphate of soda or Glauber's-salt.

MIRABLE, a. *mī'rā-bl* [L. *mīrab'īlis*, wonderful]: in OE., attracting admiration; wonderful.

MIRACLE, n. *mīr'ā-kl* [F. *miracle*—from L. *mirac'ulum*, a wonder—from *miror*, I wonder or marvel at: It. *miracolo*]: *literally*, a marvel or wonder; thence, popularly, a supernatural event; something beyond human power to do; an event apparently contrary to the established course of things and effected by Divine power. MIRACULOUS, a. *mī-rāk'ū-lūs*, of the nature of a miracle; done by superhuman power; effected by Almighty power, and not by apparent natural causes. MIRAC'ULOUSLY, ad. -*lī*. MIRAC'ULOUSNESS, n. -*nēs*, state of being effected by a miracle. MIRACLE-PLAY, an old dramatic entertainment, the subject of which was taken from the histories of the Old and New Testaments, or from the legends of saints and martyrs (see MYSTERIES).

MIRACLE.

MIR'ACLE: term commonly applied to certain marvellous works, e.g., healing the sick, raising the dead, changing of water into wine; ascribed in the Bible to some of the ancient prophets, and to Jesus Christ, and some of his apostles or servants. M. signifies simply that which is wonderful—a thing or a deed to be wondered at, being directly from the Latin *miraculum*, a thing unusual—object of wonder or surprise. The same meaning is the governing idea in the term applied in the New Testament to the Christian miracles, *teras*, a marvel, a portent; besides which, they are designated also as *dunameis*, powers, with reference to the power residing in the miracle-worker; and *sêmeia*, signs, with reference to the character or claims of which they were assumed to be the witnesses or guarantees. Under these different names, the one fact recognized is a deed done by a man, and acknowledged by the common judgment of men to exceed man's ordinary powers; a deed, which being above or beyond the common powers of nature as these are understood by men, bears witness to a *supernatural* interposition, or a *superhuman* aid.

In the older speculations on the subject, a M. was generally defined to be a violation or at least a suspension of the order of nature. While, on one hand, it was argued (as by Hume), that such a violation or suspension was absolutely impossible and incredible; it was maintained, on the other, that the Almighty, either by his own immediate agency, or by the agency of others, could interfere with the operation of the laws of nature, in order to secure certain ends, which, without that interference, could not have been secured, and that there was nothing incredible in the idea of a law being suspended or set aside by the person by whom it had been made. The laws of nature and the will or providence of God were, in this view, placed in a certain aspect of opposition to each other, as though clashing at points here and there, and the stronger arbitrarily asserting its superiority. Such a view has, with the advance of philosophical opinion, appeared to many to be inadequate as a theory, and to give an unworthy conception of the Divine character. The great principle of law—which is the essential principle of order or harmony—being the highest conception not only of nature, but of the infinite Divine Providence, in all its manifestations, has asserted itself more dominantly in the realm of thought, and led increasingly to the rejection of the apparently conflicting idea of 'interference,' implied in the old notion of M. Order in nature, and an unchanging will in God, are felt to be first and absolutely necessary principles. The idea of M., accordingly, which seems to be most readily accepted by Christian thinkers of the present day, has its root in this recognized necessity.

All law is to be regarded as the expression, not of a lifeless force, but of an infinitely wise and perfect will. All law must develop itself through natural phenomena; but it is not identified with or bound down to any neces-

MIRACLE.

sary series of these. If we admit the mainspring of the universe to be a living will, then we may admit that the phenomena through which that will, acting in the form of law, expresses itself, may vary without the will varying or the law being broken or even suspended. We know absolutely nothing of the mode of operation in any recorded M.; we only see certain results. To affirm that these results are either impossible in themselves, or necessarily violations of natural law; is to pronounce a judgment on imperfect data. We can only say that, under an impulse which we must believe proceeds from the Divine will, in which all law exists, the phenomena which we have been accustomed to expect have not followed on their ordinary conditions. But from our point of view we cannot affirm that the question as to *how* this happens is one of interference or violation; it is entirely possible and exceeding probable that it is one of higher and lower ranges of activity. The M. may be but the expression of the one Divine order and beneficent will in a new form, along lines fully in accordance with the order of nature, though not heretofore in the compass of our knowledge. We can no more claim to know all the lines of law that are known to infinite wisdom than we can claim to have created the firm unchanging order of the heavens and the earth.

Nature being but the plastic medium through which the will of the living God is ever manifested to us, and the design of that will being, as it necessarily must be, the good of his creatures, that theory of M. is certainly most rational which does not represent the ideas of laws and of the will of God as separate and opposing forces, but which represents the Divine will as working out its highest moral ends, not against, but through law and order, and evolving from these a new issue, when it has a special beneficent purpose to serve. And thus, too, we are enabled to see in M. not only a wonder and a power, but a sign—a revelation of Divine character, never arbitrary, always generous and loving, the character of one who seeks through all the ordinary courses of nature and operation of law to further His creatures' good, and whose will, when that end is to be served, is not restricted to any one necessary mode or order of expression. Rightly interpreted, M. is not the mere assertion of power, or a mere device to impress an impressible mind; it is the revelation of a will which, while leaving nature as a whole to its established course, can yet witness to itself as above nature, when, by doing so, it can help man's moral and spiritual being to grow into a higher perfection. Even the human will, when disciplined and wisely developed, can use natural laws in lines and to results which to the more limited mind seem contrary to all laws. Such activity is one of the constant characteristics of civilized life.

The evidence for the Christian miracles is of a twofold kind—external and internal. As alleged facts, they are supposed to rest on competent testimony, the testimony

MIRACULOUS CONCEPTION.

of eye-witnesses, who were neither deceived themselves, nor had any motive to deceive others. They occurred not in privacy, like the alleged supernatural visions of Mohammed, but mostly in the open light of day, amid the professed enemies of Christ. They were not isolated facts, nor wrought tentatively, or with difficulty; but the repeated, the overflowing expression, as it were, of an apparently supernatural life. It seems impossible to conceive, therefore, that the apostles could have been deceived as to their character. They had all the means of scrutinizing and forming a judgment regarding them that they could well have possessed; and if not deceived themselves, they were certainly not deceivers. There is no historical criticism that would now maintain such a theory; even the most positive unbelief has rejected it. The career of the apostles forms throughout an irrefragable proof of the deep-hearted and incorruptible sincerity that animated them. The gospel miracles, moreover, are supposed in themselves to be of an obviously Divine character. They are, in the main, miracles not of ostentatious power, *mere* wonders; but of healing, of beneficence, in which the light equally of the Divine majesty and of the Divine love shines—witnessing to the eternal life which underlies all the manifestations of decay, and all the traces of sorrow in the lower world, and lifting the mind directly to the contemplation of the sphere in which that life dwells and acts.

MIRAC'ULOUS CONCEPTION, THE: production by the direct power of the Holy Spirit from the life and substance of the Virgin Mary, of the true and complete bodily humanity of Jesus Christ. It is the point at which the established Christian theology dates the essential union of the Son of God—the Word from everlasting—with humanity as subsisting in the flesh. See INCARNATION (under INCARNATE): CHRIST, THE: JESUS CHRIST: MESSIAH: CHRISTOLOGY: CHALCEDON, COUNCIL OF.

MIRAGE.

MIRAGE, n. *mă-râzh'* [F. *mirage*—from *mirer*, to look at carefully]: curious natural illusion, very common in certain localities, and as simple in its origin as astonishing in its effects. Under it is classed the appearance of distant objects as double, or as if suspended in the air, erect or inverted, etc. One cause of M. is a diminution of the density of the air near the surface of the earth, produced by the transmission of heat from the earth, or in some other way; the denser stratum being thus placed *above*, instead of, as is usually the case, *below* the rarer. Now, rays of light from a distant object, situated in the denser medium (i.e., a little above the earth's level), coming in a direction nearly parallel to the earth's surface, meet the rarer medium at a very obtuse angle, and (see REFRACTION) instead of passing into it, are reflected back to the dense medium; the common surface of the two media acting as a mirror. Suppose, then, a

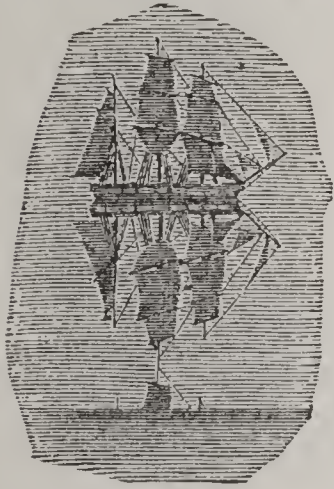


Fig. 1.

spectator to be situated on an eminence, and looking at an object situated like himself in the denser stratum of air, he will see the object by means of directly transmitted rays; but besides this (see fig. 2), rays from the object will be reflected from the upper surface of the rarer stratum of air beneath to his eye. The image produced by the reflected rays will appear inverted, and below the real object, just as an image reflected in water appears when observed from a distance. If the object is a cloud or portion of sky, it will appear by the reflected rays as lying on the surface of the earth, and bearing a strong resemblance to a sheet of water; also, as the reflecting surface is irregular, and constantly varies its position, owing to the constant communication of heat to the upper stratum, the reflected image will be constantly varying, and will present the appearance of a water surface ruffled by the wind. This form of M., which even experienced travellers have found completely deceptive, is frequent in the arid deserts of Lower Egypt, Persia, Tartary, etc.

In particular states of the atmosphere, reflection of a portion only of the rays takes place at the surface of the dense medium, and thus double images are formed—one by reflection, and the other by refraction—the first inverted, and the second erect. The phenomena of M. are frequently much more strange and complicated, the images being often much distorted and magnified, and in some instances occurring at a considerable distance from the object, as in the case of a tower or church seen over the sea, or a vessel over dry land, etc. The particular form of M. known as *looming* is very frequently observed at sea, and consists in an excessive apparent elevation of the object. A most remarkable case of this sort occurred 1798, July 26, at Hastings, England. From

MIRANDOLA—MIRBANE.

this place the French coast is 50 m. distant; yet from the sea-side the whole coast of France from Calais to near Dieppe was distinctly visible, and continued so three hours. In the Arctic regions it is a common occurrence for whale-fishers to discover the proximity of other ships by means of their images seen elevated in the air, though the ships themselves may be below the horizon. Generally, when the ship is above the horizon, only one image, and that inverted, is found; but when it is wholly or in great part below the horizon, double images (see fig. 1), one erect and the other inverted, are frequently seen. The faithfulness and distinctness of these images at times may be imagined from the fact, that Capt. Scoresby, while cruising off the coast of Greenland 1822, discovered the fact that his father's ship was in his vicinity from its inverted image in the sky.

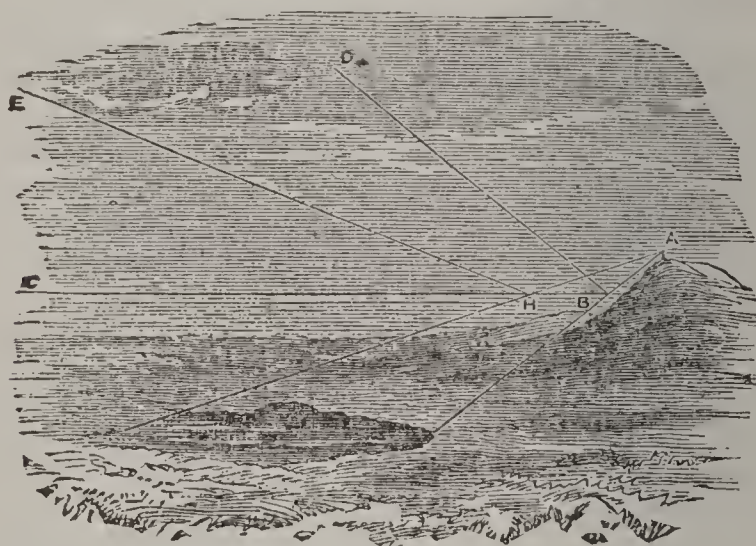


Fig. 2.

Another remarkable instance of M. occurred 1854, May, when, from the deck of the British screw-steamer, *Archer*, then cruising off Oesel, in the Baltic, the whole English fleet of 19 sail, then nearly 30 m. distant, was seen as if suspended in the air upside down. Beside such phenomena as these, the famous *Fata Morgana* (q.v.) of the Strait of Messina sinks into insignificance. The *Spectre of the Brocken*, in Hanover, is another notable instance of M. The varieties are indeed numberless: see Brewster's *Optics*, Biot's *Traité de Physique*: for the mathematical theory of the M., see the works of Biot, Monge, and Wollaston. See also REFLECTION: REFRACTION.

MIRANDOLA, *mē-rân'dō-lâ*: town of n. Italy, province of Modena, 20 m. n.n.e. of the city of Modena. It stands in the midst of a low-lying and somewhat unhealthy fiat, and contains numerous churches, a cathedral, and a citadel. Rice is much cultivated in the vicinity, and the breeding of silk-worms is an important industry. Pop. of town (1881) 3,059.

MIRAN'DOLA, PICO DELLA: see PICO, GIOVANNI DELLA MIRANDOLA.

MIR'BANE: see NITRO-BENZOL.

MIRE—MIRROR.

MIRE, n. *mīr* [Icel. *myri*, a marsh: Sw. *myra*, a bog, a marsh: Dut. *moeyer*, mire—from *moer*, a bog]: deep mud; earth very wet and soft: V. to sink deep or fix in mud; to soil with mud. **MIRING**, imp. **MIR****ED**, pp. *mīrd*. **MIRY**, a. *mīrī*, covered with mire; muddy. **MIRINESS**, n. *-rī-nēs*, state of being miry.

MIRECOURT, *mēr-kôr'*: town of France, dept. of Vosges, in a picturesque district, 20 m. s. of Nancy. It is famous for manufactures of lace, and of church-organs and stringed musical instruments. Pop. (1881) 5,169.

MIRFIELD, *mīr'fēld*: manufacturing village of the W. Riding of Yorkshire, England, three m. e. of Dewsbury. The manufactures are fancy and other woolen fabrics, and cotton-goods. It is one of the chief railway centres in the country. Pop. (1871) 12,869; (1881) 11,512.

MIRK, a., or **MURK**, a. *mērk* [AS. *mire*, dark, murky: Icel. *myrkr*, dark, or darkness: Gael. *murcas*, sadness, gloom]: in *Scot.* and *OE.*, dark, gloomy: N. darkness; gloom. **MIRKSOME**, a. *mērk'sūm*, in *OE.*, dark; obscure. **PIT-MIRK** [AS. *pic*; Dut. *pik*; Scot. *pik*; Icel. *bik*, pitch]: in *Scot.*, very dark; pitch-dark.

MIRPUR, *mēr-pôr'*: flourishing town of India, in Sinde, on the left bank of the Piniari, 45 m. s. of Hyderabad. It contains a fort capable of accommodating 200 men, and commanding the route from Hyderabad to Cutch. The surrounding district is fertile and well cultivated. Pop. 3,000.

MIRROR, n. *mīr'ēr* [F. *miroir*; OF. *mireor*, a mirror—from mid. L. *mīrārē*, to behold—from L. *mīror*, I wonder at, I admire]: any polished body capable of reflecting images of objects; a looking-glass: a pattern or example, as, 'she was a *mirror* of grace': V. to reflect or shadow forth as in a mirror. **MIRRORING**, imp. *mīr'ēr-īng*. **MIRRORED**, pp. a. *-ērd*, reflected as in a mirror.—A *Mirror* is made usually of glass, lined at the back with a brilliant metal, so as strongly to reflect the image of any object placed before it. When mirrors were invented is not known, but the use of a reflecting surface would become apparent to the first person who saw his own image reflected from water; and probably for ages after the civilization of man commenced, the still waters of ponds and lakes were the only mirrors; but we read in the Pentateuch of mirrors of brass being used by the Hebrews. Mirrors of bronze were in very common use among the ancient Egyptians, Greeks, and Romans; and many specimens are preserved in museums. Praxiteles taught the use of silver in the manufacture of mirrors B.C. 328. Mirrors of glass were made first at Venice A.D. 1300; and judging from those remaining—of which one may be seen at Holyrood Palace, in the apartments of Queen Mary—they were very rude contrivances, compared with modern ones. It was not until 1673 that the making of mirrors was introduced into England. It is now a very important manufacture; and mirrors can be produced of any size to which plate-glass can be cast. After the plate

MIRTA—MIRZAPUR.

of glass is polished on both sides, it is laid on a perfectly level table of great strength and solidity, usually of smooth stone, made like a billiard-table with raised edges; a sheet or sheets of tinfoil sufficient to cover the upper surface of the glass are then put on and rubbed down smooth, after which the whole is covered with quicksilver, which immediately forms an amalgam with the tin. The superfluous mercury is then run off, and a woollen cloth is spread over the whole surface, and square iron weights are applied. After this pressure has been continued a day and night, the weights and the cloth are removed, and the glass is removed to another table of wood, with a movable top, which admits of gradually increasing inclination until the unamalgamated quicksilver has perfectly drained away, and only the surface of perfect amalgam remains coating the glass, and perfectly adherent to it.

Heat is reflected like light; so that a concave M. may be used to bring rays of heat to a focus. In this way combustible substances may be set on fire at a distance from the reflector whence they receive their heat. Thus used, a M. is called a *Burning M.*

MIRTA, *mér'ta*: town of India, in the Rajpoot state of Joudpore, on high ground near the source of a tributary of the Luni, 230 m. s.w. of Delhi. M. is supplied with good water from 3 large tanks. Pop. estimated 25,950.

MIRTH, n. *mérth* [Lap. *murre*, delight: Gael. *mir*, to sport, to play; *mireag*, a sporting, frolic: perhaps connected with Eng. *merry*]: social merriment; the excitement of pleasurable feelings in company; noisy gayety. MIRTHFUL, a. *mérth'fûl*, merry; jovial. MIRTHFULLY, ad. *-lî*. MIRTHFULNESS, n. *-nës*, state or quality of being mirthful. MIRTHLESS, a. *-lës*, without mirth.—SYN. of 'mirth': frolic; fun; gayety; laughter; merriment; festivity; jollity; gladness; joyousness; hilarity; glee; cheerfulness.

MIRY: see under MIRE.

MIRZA, n. *mér'zã* [Pers. *mirza*, corrupted from *Emir-zadeh*, sons of the prince]: in *Persia*, when *prefixed* to the surname of a person, the common title of honor among the Persians; but when *annexed* to the surname, it designates a prince or a male of the blood-royal.

MIRZAPUR, *mër-za-pôr'*: district in the N. W. Provinces; watered by the Ganges and the Son; lat. 23° 50'—25° 30' n., lon. 82° 11'—83° 39' e.; 5,224 sq. m. The chief productions, besides the usual cereals, are cotton, indigo, and sugar. The climate is, on the whole, unhealthful for Europeans. Pop. (1891) 1,161,808, almost all Hindus.

MIRZAPUR': town of British India, cap. of the dist. of M.; on the right bank of the Ganges, which is here half a mile wide and crossed by a ferry; 40 m. s.w. of Benares. It has some manufactures of carpets, cottons, and silks, and was the greatest cotton-mart in India; but in recent years its trade has gone largely to Cawnpore. Pop. (1881) 56,378; (1891) 82,710; (1901) 79,862.

MIS—MISBELIEF.

MIS, *mīs* [Goth. *mis*, implying error, separation: Icel. *á mis*, astray, in turns; *missa*, to lose: AS. and Icel. *mis*]: a prefix, signifying 'divergence'; error; defect; wrong. *Note*.—Skeat affirms that *mis* the prefix is sometimes used for the OF. *mes*, as in *mes-chief* = mis-chief, which *mes* is derived from L. *minus*, less, used as a depreciatory prefix in 'mis-alliance, mis-chance, miscreant, mis-count,' etc.

MISACCEPTATION, n. *mīs'āk-sēp-tā'shūn* [*mis*, error, and *acceptation*]: the taking in a wrong sense.

MISADVENTURE, n. *mīs'ād-rēn'tūr* [*mis*, error, and *adventure*: comp. F. *mes*, prefix—from L. *minus*]: a mishap; ill luck; unlucky accident.—**SYN.**: misfortune; calamity; disaster; infelicity; mischance.

MISADVISED, a. *mīs'ād-vīzd'* [*mis*, wrong, and *advised*]: ill-advised; ill-directed.

MISALLIANCE, n. *mīs'āl-lī'āns* [*mis*, wrong, and *alliance*: comp. F. *mes*, for *mis*—from L. *minus*]: a disparaging or improper connection by marriage; a marriage below one's rank; any wrong alliance; also written **MESALLIANCE**.

MISANTHROPE, n. *mīs'ān-thrōp* [Gr. *misanthrōpōs*, hating mankind—from *mīseō*, I hate; *anthrōpos*, man: F. *misanthrope*]: a hater of mankind; also **MISANTHROPIST**, n. *mīs-ān'thrō-pīst*. **MIS'ANTHROP'IC**, a. *-thrōp'ik*, or **MIS'ANTHROP'ICAL**, a. *-ī-kāl*, hating or having a dislike to mankind. **MISANTHROPY**, n. *mīs-ān'thrō-pī*, hatred or dislike to mankind—opposite of *philanthropy*.

MISAPPLY, v. *mīs'āp-plī'* [*mis*, wrong, and *apply*]: to apply to a wrong purpose. **MIS'APPLY'ING**, imp. **MIS'APPLIED'**, pp. *-plīd'*. **MISAPPLICATION**, n. *mīs'āp-plī-kā'shūn*, an application to a wrong purpose.

MISAPPREHEND, v. *mīs'āp-prē-hēnd'* [*mis*, wrong, and *apprehend*]: to take in a wrong sense; to misunderstand. **MIS'APPREHEN'DING**, imp. **MIS'APPREHEN'DED**, pp. **MIS'APPREHEN'SION**, n. *-hēn'shūn*, a mistake; misunderstanding; misconception.

MISAPPROPRIATE, v. *mīs'āp-prō'při-āt* [*mis*, wrong, and *appropriate*]: to use for a purpose for which it was not designed. **MIS'APPRO'PRIATING**, imp. **MIS'APPRO'PRIATED**, pp. **MIS'APPRO'PRIA'TION**, n. *-při-ā'shūn*, wrong appropriation.

MISBECOME, v. *mīs'bē-kūm'* [*mis*, wrong, and *become*]: to suit ill; not to become. **MIS'BECOM'ING**, imp.: **ADJ.** unseemly; improper. **MIS'BECOM'INGLY**, ad. *-lī*.

MISBEGOTTEN, a. *mīs'bē-gōt'n* [*mis*, wrong, and *begotten*]: unlawfully begotten.

MISBEHAVE, v. *mīs'bē-hāv'* [*mis*, wrong, and *behave*]: to conduct one's self improperly. **MIS'BEHA'VING**, imp. **MIS'BEHAVED'**, pp. *-hāv'd'*. **MIS'BEHAV'IOR**, n. *-hāv'yēr*, ill conduct; rude or uncivil behavior.

MISBELIEF, n. *mīs'bē-lēf'* [*mis*, wrong, and *belief*]: wrong belief; false religion.

MISBELIEVE—MISCHIEF.

MISBELIEVE, v. *mĭs'bĕ-lĕv'* [*mĭs*, wrong, and *believe*]: to believe erroneously. **MIS'BELIEV'ING**, imp. **MIS'BE-LIEVED'**, pp. *-lĕvd'*. **MIS'BELIEV'ER**, n. one who believes erroneously.

MISCALCULATE, v. *mĭs-kăł'kŭ-lăt* [*mĭs*, wrong, and *calculate*]: to calculate wrongly. **MISCAL'CU-LATING**, imp. **MISCAL'CU-LATED**, pp. **MISCAL'CU-LA'TION**, n. *-lă'-shŭn*, an erroneous calculation.

MISCALL, v. *mĭs-kawl'* [*mĭs*, wrong, and *call*]: to call by a wrong name; to abuse or revile. **MISCALL'ING**, imp. **MISCALLED'**, pp. *-kawld'*: **ADJ.** misnamed.

MISCARRIAGE, n. *mĭs-kăr'ĭj* [*mĭs*, wrong, and *carriage*]: failure; unfortunate issue of an undertaking; the expulsion of the fœtus within six weeks after conception. *Note.*—The expulsion of the fœtus between six weeks and six months is called *abortion*; and if birth occurs any time between six and nine months, it is called *premature labor* or *birth*; *miscarriage* and *abortion* take place without life, but in a *premature birth* there very frequently is life.

MISCARRY, v. *mĭs-kăr'ĭ* [*mĭs*, wrong, and *carry*]: to fail of the intended effect; not to reach its destination; to expel the fœtus within six weeks after conception. **MISCAR'RYING**, imp. **MISCAR'RIED**, pp. *-kăr'id*.

MISCEGENATION, n. *mĭs'sĕ-jĕn-ă'shŭn* [L. *miscĕō*, I mix; *genĕrĕ*, to beget]: mixing of races; interbreeding of white men with women of another and lower race, or conversely. The term in the United States has application specially to amalgamation of the white and negro races, such as was fostered by the social conditions of slavery, but is said to have now almost ceased. See **MIXED RACES**.

MISCELLANY, n. *mĭs'sĕl-ă-nĭ* or *mĭs-sĕllă-nĭ* [F. *miscellanées*—from L. *miscellănĕă*, a hash of different sorts of broken meat, miscellaneous—from *miscĕō*, I mix: It. *miscellanea*]: a mass or mixture, generally; a book containing a variety of literary compositions. **MIS'CELLA-NA'RIAN**, n. *-nă'rĭ-ăn*, a writer of miscellanies: **ADJ.** pertaining to. **MIS'CELLA'NEOUS**, a. *-lă'nĭ-ŭs*, consisting of several kinds mixed. **MIS'CELLA'NEOUSLY**, ad. *-lĭ*. **MIS'CELLA'NEOUSNESS**, n. *-ŭs-nĕs*, the state of being miscellaneous. **MISCEL'LANIST**, n. *-lă-nĭst*, a writer in a miscellany or of miscellanies.

MISCHANCE, n. *mĭs-chăns'* [*mĭs*, wrong, and *chance*: OF. *meschance*, a mischief]: ill fortune; mishap.—**SYN.**: calamity; misfortune; disaster; misadventure; infelicity; ill luck.

MISCHIEF, n. *mĭs'chĭf* [OF. *meschef*, misfortune—from *mes*, error; *chef*, the head: Sp. *menoscabo*, loss—from *menos*, less; *cabo*, the head: L. *minus*, less; *caput*, the head]: that which turns out ill; harm; hurt; injury, whether intended or not; ill consequence. **MISCHIEV-ous**, a. *mĭs'chĭv-ŭs*, injurious; hurtful; producing harm or injury; prone to do mischief. **MIS'CHIEVOUSLY**, ad.

MISCHNA—MISDEED.

-**Ė.** MIS'CHIEVOUSNESS, n. -nės, the quality of being mischievous; hurtfulness.—SYN. of 'mischief': evil; ill; damage; detriment; wrong; injustice;—of 'mischievous': pernicious; destructive; detrimental; harmful; noxious; spiteful; wicked.

MISCHNA: see MISHNA.

MISCIBLE, a. *mīs'sī-bl* [F. *miscible*—from mid. L. *miscibilis*—from L. *miscēō*, I mix]: in *OE.*, capable of being mixed or mingled; that may be mingled, as one liquid with another.

MISCOMPUTE, v. *mīs'kōm-pūt'* [*mis*, wrong, and *compute*]: to compute or reckon wrongly. MIS'COMPU'TING, imp. MIS'COMPU'TED, pp. MISCOM'PUTA'TION, n. -tā'shūn, erroneous computation.

MISCONCEIVE, v. *mīs'kōn-sēv'* [*mis*, wrong, and *conceive*]: to have or receive a false notion of; to interpret incorrectly. MIS'CONCEIV'ING, imp. MIS'CONCEIVED', pp. -sēvd'.—SYN. of 'misconceive': to mistake; misjudge; misunderstand; misapprehend.

MISCONCEPTION, n. *mīs'kōn-sēp'shūn* [*mis*, wrong, and *conception*]: wrong notion or understanding of a thing; false opinion.

MISCONDUCT, n. *mīs-kōn'dūkt* [*mis*, wrong, and *conduct*]: ill behavior: V. *mīs'kōn-dūkt'*, to mismanage; to conduct amiss; to misbehave. MIS'CONDUCT'ING, imp. MIS'CONDUCT'ED, pp.—SYN. of 'misconduct, n.': misdeed; misbehavior; delinquency; misdemeanor; mismanagement; offense.

MISCONSTRUE, v. *mīs-kōn'strō* [*mis*, wrong, and *construe*]: to interpret in a wrong sense either words or things. MISCON'STRUING, imp. MISCON'STRUED, pp. -strōd. MIS'CONSTRUC'TION, n. -strūk'shūn, wrong interpretation of words or things.

MISCOUNT, v. *mīs-kownt'* [*mis*, wrong, and *count*: OF. *mesconter*, to miscount]: to mistake in counting. MISCOUNT'ING, imp. MISCOUNT'ED, pp.

MISCREANT, n. *mīs'krē-ānt* [OF. *mescreant*, misbelieving, miscreant—from L. *minus credēre*, to believe amiss: F. *mécréant*, one who believes amiss, a miscreant: It. *miscredente*, an unbeliever, a miscreant]: originally, one who holds a false faith—the word which, in their detestation of the so-called heresy, the multitude applied to the early Protestants, as to the followers of Wickliffe; a vile unprincipled wretch: ADJ. unbelieving.

MISCREATE, v. *mīs'krē-āt'* [*mis*, wrong, and *create*]: in *OE.*, to form unnaturally. MIS'CREA'TING, imp. MIS'CREA'TED, pp.

MISDATE, n. *mīs-dāt'* [*mis*, wrong, and *date*]: wrong date: V. to date wrongly. MISDA'TING, imp. MISDA'TED, pp.

MISDEED, n. *mīs-dēd'* [*mis*, wrong, and *deed*]: an evil deed; a wicked action.—SYN.: crime; fault; offense; transgression; trespass; misconduct; misdemeanor,

MISDEEM, v. *mĭs-dēm'* [*mis*, wrong, and *deem*]: in *OE.*, to judge ill of; to mistake. **MISDEEM'ING**, imp. **MISDEEMED'**, pp. *-dēmġ'*.

MISDEMEAN, v. *mĭs'dě-mēn'* [*mis*, wrong, and *de-mean*]: to behave ill. **MISDEMEANOR**, n. *mĭs'dě-mēn'ér*, ill behavior; evil conduct; a petty crime.—**SYN.** of 'misdemeanor': see under **MISDEED**.

MISDEMEAN'OR: lesser of two great classes into which crimes below the grade of treason are divided, Felony (q.v.) being the greater; but does not seem properly to include the numerous petty offenses which local magistrates have power to try and punish, and for which there is no specific legal designation. Misdemeanors may be either violations of the common law or offenses specifically noted by statute. To the former class belong injuries to the property of another or of the public, disturbances of the peace, cruel treatment of animals, endangering the safety of others by carelessness or violence, etc. For violations of a statute, an indictment may be secured, and the penalty is largely determined by the statute itself. In common law, offenses under the head of misdemeanors are punishable either by fine or imprisonment, or both, as the court may decide. In some states, however, there are limits to the degree of punishment which may be imposed. A M. is sometimes settled by arbitration even after it has been brought into court. But, while the court may waive criminal proceedings when a satisfactory arrangement has been made by the parties directly concerned, its consent to the compromise must be secured in order to insure its validity. The costs incurred in the case are imposed on the offender. Whenever a sentence is imposed for a M., it is at the option of the court to require bonds that the offender shall keep the peace.

MISDESERT, n. *mĭs'dě-zěrt'* [*mis*, wrong, and *desert*]: in *OE.*, wrong or ill desert.

MISDIET, n. *mĭs-dī'ět* [*mis*, wrong, and *diet*]: in *OE.*, improper food.

MISDIRECT, v. *mĭs'dī-rěkt'* [*mis*, wrong, and *direct*]: to give a wrong direction to; to direct to a wrong person or place. **MIS'DIRECT'ING**, imp. **MIS'DIRECT'ED**, pp. **MIS'DIRECT'ION**, n. *-rěk'shŭn*, evil direction.

MISDO, v. *mĭs-dô'* [*mis*, wrong, and *do*: Dut. *misdoen*; Ger. *missthun*, to misdo]: to do wrong; to do amiss; to commit faults. **MISDO'ING**, imp. doing wrong: N. an offense. **MISDO'ER**, n. *-ér*, one who commits a fault or crime.

MISDOUBT, v. *mĭs-dowt'* [*mis*, wrong, and *doubt*]: to suspect, as of deceit or crime: N. suspicion, as of crime or danger. **MISDOUBT'FUL**, a. misgiving; full of grave doubts.

MISELTOE: see **MISTLETOE**.

MISEMPLOY, v. *mĭs'ēm-ploy'* [*mis*, wrong, and *em-ploy*]: to employ to no purpose, or to a bad purpose; to use amiss. **MIS'EMPLOY'ING**, imp. **MIS'EMPLOYED'**, pp. *-ployd'*.

MISENO, *mĕ-sā'nō*: promontory of the province of Naples, 9 m. s.w. of the city of Naples. On the outskirts of the promontory are the extensive ruins of the ancient city Misenum, including a vast church and theatre. M. is much visited on account of its wonderful grotto Draconara, and a curious subterranean building or labyrinth, called the Hundred Chambers, supposed to have been anciently used as dungeons.

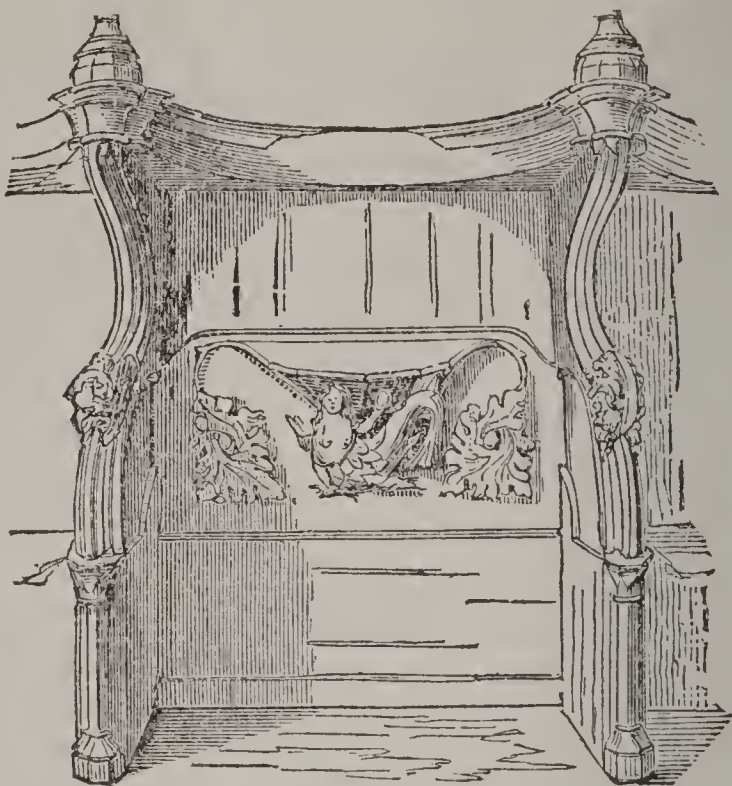
MISER, n. *mĭz'ēr* [L. *miser*, miserable: It. and Sp. *misero*, wretched, miserable]: one whose chief pleasure is the acquirement and hoarding up of money; one who, though wealthy, lives miserably through dread of poverty. **MIS'ERLY**, a. *-lĭ*, very covetous; very mean; sordid; niggardly.—**SYN.** of 'miserly': stingy; mean; parsimonious; avaricious; penurious; covetous.

MISERABLE, a. *mĭz'ēr-ă-bl* [OF. *miserable*—from L. *miserābilis*, deserving of pity—from *misĕror*, I pity—from *miser*, wretched: It. *miserabile*]: very unhappy; wretched; extremely poor or mean; despicable; barren. **MIS'ERABLY**, ad. *-ă-blĭ*. **MIS'ERABLENESS**, n. *-bl-nĕs*, the state of being miserable. **MISERY**, *mĭz'ēr-ĭ* [F. *misère*—from L. *miserĭā*, misery]: extreme pain of body or mind; great unhappiness; distress; calamity; in *OE.*, covetousness; avarice.—**SYN.** of 'miserable': forlorn; abject; pitiable;—of 'misery': misfortune; unhappiness; wretchedness; anguish; torture; agony; torment.

MISERERE, n. *mĭz'ēr-ĕ'rĕ* [L. have mercy—from *misĕrĕor*, I have mercy]: in Rom. Cath. usage, name of Ps. l. of the Vulgate (li. in authorized version), beginning in Latin with the word *Miserere*, Have mercy. It is one of the so-called 'Penitential Psalms,' and is commonly believed to have been composed by David in the depth of his remorse for the double crime which the prophet Nathan rebuked in the well-known parable (II Sam. xii.). Another opinion, however, attributes this psalm to Manasses, or to some of the psalm-writers of the captivity. The M. is of frequent occurrence in the services of the Roman Church; and in the celebrated service of Tenebræ, as performed in the Sixtine Chapel at Rome, it forms, as chanted by the pope's choir, one of the most striking and impressive chants in the entire range of sacred music. It is sung on each of the three nights in Holy Week (q.v.) on which the office of Tenebræ is held, with different music on each of the three occasions, the three composers being Bai, Bainsi, and the still more celebrated Allegri.—M. is the name also of one of the evening services in Lent, which is so called from the singing of that psalm; which service includes a sermon, commonly on the duty of sorrow for sin.—**MIS'ERERE** is the name also of a projection on the under side of the seats of the stalls of mediæval churches and chapels,

MISERY—MISGIVE.

etc.; usually ornamented with carved work, and so shaped that, when the seat-proper is folded up, it forms a small seat at a higher level, sufficient to afford some



Miserere:

From Billings's *Carlisle Cathedral*.

support to a person resting upon it. Aged and infirm ecclesiastics were allowed to use these during long services.

MISERY: see under **MISERABLE**.

MISFEASANCE, n. *mĭs-fā'zāns* [OF. *mes*, wrong; *faisance*, manner, method: F. *faisances*, manorial services]: a trespass; a wrong done; the improper doing of an act which a person might lawfully do. *M.* in law is the doing of a positive wrong, in distinction from nonfeasance, which means a mere omission. Acts are sometimes followed with different legal consequences, according as they fall under the head of misfeasance or nonfeasance.

MISFEIGN, v. *mĭs-fān'* [*mis*, wrong, and *feign*]: in *OE.*, to feign with an ill design.

MISFIT, n. *mĭs-fĭt'* [*mis*, wrong, and *fit*]: a bad fit.

MISFORM, v. *mĭs-fawrm'* [*mis*, wrong, and *form*]: to make of an ill form. **MISFORMING**, imp. *mĭs-fawr'mĭng*. **MISFORMED'**, pp. *-fawrmd'*.

MISFORTUNE, n. *mĭs-för'tün* or *-chün* [*mis*, wrong, and *fortune*]: ill fortune; adversity; mishap; disaster; calamity.—**SYN.**: mischance; misadventure; ill; harm.

MISGIVE, v. *mĭs-gĭv'* [*mis*, wrong, and *give*]: to fill with doubt; to deprive of confidence; to fail, applied to the heart, as, my heart *misgave* me. **MISGIV'ING**, imp.: N. a failing of confidence; doubt; mistrust. **MISGAVE'**, pt. *-gāv'*. **MISGIV'EN**, pp. *-gĭv'n*.

MISGOTTEN, a. *mīs-gōt'n* [*mis*, wrong, and *gotten*]: in *OE.*, unjustly obtained.

MISGOVERN, v. *mīs-gŭv'ĕrn* [*mis*, wrong, and *govern*]: to govern ill; to administer unfaithfully. MISGOV'ERN-ING, imp. MISGOV'ERNED, pp. -*ĕrnd*. MISGOV'ERNMENT, n. -*mĕnt*, ill management either of public or of private affairs; disorder; irregularity.

MISGRAFF, v. *mīs-grăf'* [*mis*, wrong, and *graff*]: in *OE.*, to graff on a wrong or improper stock.

MISGUIDE, v. *mīs-gīd'* [*mis*, wrong, and *guide*]: to lead or guide into error; to direct ill. MISGUID'ING, imp. MISGUID'ED, pp. MISGUID'ANCE, n. -*gīd'āns*, the act of leading into error; false direction. MISGUID'INGLY, ad. -*lī*.

MISHANDLE, v. *mīs-hānd'l* [*mis*, wrong, and *handle*]: to bungle; to treat badly.

MISHAP, n. *mīs-hăp'* [*mis*, wrong, and *hap*]: ill chance; an accident.—*SYN.*: see MISFORTUNE.

MISHAPPEN, v. *mīs-hăp'n* [*mis*, wrong, and *happen*]: to happen ill.

MISHEAR, v. *mīs-hēr'* [*mis*, wrong, and *hear*]: to hear imperfectly.

MISHMEE BITTER, *mīsh'mē bīt'ēr*: root of *Coptis Teeta* (see COPTIS), a plant found in the mountainous regions on the borders of India and China; of the same genus with the Golden Thread of the northern parts of the world, and not unlike it. The root is in much use and esteem in parts of the east as a stomachic and tonic, and has begun to be known in Europe.—The root also of *C. trifoliata* is used as a bitter.

MISHNA, n., or MISCHNA, *mīsh'nă* [Heb. *mishnah*, repetition, explanation—from *shanah*, to repeat, also to learn]: great collection of decisions by the ancient Rabbis on the Hebrew law, including traditions of the Jews and interpretations of passages of Scripture; forming, with the *Gemara*, the text of the Talmud. MISH'NIC, a. -*nīk*, pertaining to or relating to the Mishna.—*Mishna* comprises the body of the 'Oral Law,' or the juridico-political, civil, and religious code of the Jews; and forms, as such, a kind of complement to the Mosaic or Written Law, which it explains, amplifies, and immutably fixes. It was not, however, the sole authority of the schools and the masters on which these explanations and the new ordinances to which they gave rise depended, but rather certain distinct and well-authenticated traditions, traced to Mount Sinai itself. No less were certain special letters and signs in the Written Law appealed to in some cases, as containing an indication to the special, newly issued, or fixed prohibitions or rules: see HALACHA. The M. (to which the Toseftas and Borraithas form supplements) was finally redacted, after some earlier incomplete collections, by Jehudah Han-assi, A.D. 220 at Tiberias. It is written mostly in pure Hebrew, and is divided into six portions (Sedarim): 1.

MISILMERI—MISLAY.

Zeraim (Seeds), on Agriculture; 2. Moed (Feast), on the Sabbath, Festivals, and Fasts; 3. Nashim (Women), on Marriage, Divorce, etc. (embracing also the laws on the Nazirship and Vows); 4. Nezikin (Damages), chiefly civil and penal law (also containing the ethical treatise Aboth); 5. Kadashim (Sacred Things), Sacrifices, etc.; description of the Temple of Jerusalem, etc.; 6. Tehoroth (Purifications), on pure and impure things and persons. See TALMUD.

MISILME'RI (corrupted from *Menzil-al-Amir*, Village of the Emirs): town of the island of Sicily, province of Palermo, 7 m. s.e. of Palermo city. It is a straggling, poverty-stricken town. It was at M. that Garibaldi, 1860, May, joined the Sicilian insurgents; and it was by a short cut from M. to Palermo, through the pass of Mezzagagna, that he advanced on Palermo and took it by a *coup-de-main*. M. was formerly a notorious harbor of banditti. Pop. 10,500.

MISIMPROVE, v. *mĭs'ĭm-prôv'* [*mis*, wrong, and *improve*]: to abuse; to improve to a bad purpose. MIS-IMPROV'ING, imp. MIS'IMPROVED', pp. -*prôvd'*. MIS-IMPROVE'MENT, n. -*prôv'mënt*, ill use or employment.

MISINFORM, v. *mĭs'ĭn-fawrm'* [*mis*, wrong, and *inform*]: to give wrong information to. MIS'INFOR'MING, imp. -*fawrmĭng*. MIS'INFORMED', pp. -*fawrmd'*.

MISINTEND, v. *mĭs'ĭn-tënd'* [*mis*, wrong, and *intend*]: in OE., to misdirect; to aim badly. MISINTEND'ED, a. ill-directed.

MISINTERPRET, v. *mĭs'ĭn-tér'prèt* [*mis*, wrong, and *interpret*]: to understand or explain in a wrong sense; to form false opinions or notions. MIS'INTER'PRETING, imp. MIS'INTER'PRETED, pp. MIS'INTER'PRETER, n. one who interprets wrongly. MIS'INTER'PRETA'TION, n. -*shûn*, a mistaken or false interpretation.

MISJUDGE, v. *mĭs-jűj'* [*mis*, wrong, and *judge*]: to judge erroneously; to form false opinions or notions of; to mistake. MISJUDG'ING, imp. MISJUDGED', pp. -*jűjd'*. MISJUDG'MENT, n. -*mënt*, an unjust judgment or determination.

MISKOLCZ, *mĭsh-kôlts'*: principal town in the county of Borsod, Hungary, at the extremity of a beautiful valley, 25 m. n.e. of Erlau. It is connected with Debreczin by railway, and contains numerous churches, two gymnasia, and other educational institutions. Wine and melons are extensively cultivated. From the iron obtained in the vicinity, the best steel in Hungary is made. The chief trade is in wine. Pop. (1890) 30,408.

MISLAY, v. *mĭs-lā'* [*mis*, wrong, and *lay*]: to put aside and not afterward to recollect where; to lose; to lay in a wrong place, or out of its proper place. MISLAY'ING, imp. -*lā'ing*. MISLAID', pt. and pp. -*lād'*.

MISLE—MISPICKEL.

MISLE, v. *mǐz'l* [from *mist* (see **MIZZLE**)]: to rain in very fine drops like a thick mist. **MIS'LING**, imp. **MISLED**, pp. *mǐz'ld*.

MISLEAD, v. *mīs-lēd'* [*mis*, wrong, and *lead*]: to lead astray or into error; to deceive; to delude; to beguile. **MISLEAD'ING**, imp.: N. act of one who misleads. **MISLED'**, pt. and pp. *-lēd'*. **MISLEAD'ER**, n. *-ér*, one who leads to ill.

MISLEARNED, a. *mīs-lěrn'ēd* [*mis*, wrong, and *learned*]: not accurately or properly learned.

MISLED, pt. and pp. of **MISLEAD**, which see.

MIS'LETOE: see **MISTLETOE**.

MISLIKE, v. *mīs-līk'* [*mis*, wrong, and *like*: AS. *mis-līcan*, to displease]: to dislike.

MISLIN, or **MISLEN**: see **MASLIN**.

MISLIVE, v. *mīs-līv'* [*mis*, wrong, and *live*]: in *OE.*, to live ill.

MISMANAGE, v. *mīs-mān'āj* [*mis*, wrong, and *manage*]: to manage or conduct ill, as any matter of business. **MISMAN'AGING**, imp. **MISMAN'AGED**, pp. *-ājđ*. **MISMAN'AGEMENT**, n. *-āj-měnt*, improper or wrong management of any matter or affair.

MISNAME, v. *mīs-nām'* [*mis*, wrong, and *name*]: to call by the wrong name. **MISNA'MING**, imp. **MISNAMED'**, pp. *-nāmd'*.

MISNIA, or **MEISSEN**: see **MEISSEN**.

MISNOMER, n. *mīs-nō'mér* [OF. *mes*, badly, for L. *minus*, less, and F. *nommer*, to name: *mis* for *mes*, wrong, and L. *nominārē*, to name]: a wrong name; a misnaming. In *law*, the giving of a wrong name to a party in a suit. Formerly, the objection of M. was of some importance, but now is of none, as it is easily cured by amendment.

MISNUMBER, v. *mīs-nūm'bér* [*mis*, wrong, and *number*]: to count or reckon wrongly.

MISOGAMIST, n. *mīs-ōg'ā-mīst* [Gr. *misēō*, I hate; *ganos*, marriage]: a hater of marriage. **MISOG'AMY**, n. *-ā-mī*, hatred or aversion to marriage.

MISOGYNY, n. *mīs-ōg'-ī-nī* [Gr. *misēō*, I hate; *gūnē*, a woman]: hatred or aversion to women. **MISOG'YNIST**, n. *-ī-nīst*, a woman-hater.

MISORDER, v. *mīs-ōr'dér* [*mis*, wrong, and *order*]: in *OE.*, to conduct ill; to manage irregularly.

MISPICKEL, n. *mīs'pīk-l* [said to be from O. Ger. *mis-püchel*]: arsenical pyrites, an arsenide with sulphide of iron, of a tin-white color and strong metallic lustre; composition 33.54 per cent. iron, 33.42 arsenic, 21.08 sulphur; hardness 5.5 to 6; specific gravity 6 to 6.4; found mostly in crystalline rocks, and used in making white arsenic.

MISPLACE—MISREPORT.

MISPLACE, v. *mĭs-plās'* [*mĭs*, wrong, and *place*]: to put in a wrong place; to set or place on an improper object, as confidence or affections. **MISPLA'CING**, imp. **MISPLACED'**, pp. *-plāst'*. **MISPLACE'MENT**, n. *-plās'mĕnt*, the state of being misplaced; the act of putting in a wrong place.

MISPRINT, v. *mĭs-prĭnt'* [*mĭs*, wrong, and *print*]: to mistake in printing; to print wrong: N. *mĭs'prĭnt*, a mistake in printing. **MISPRINT'ING**, imp. **MISPRINT'ED**, pp.

MISPRISE, or **MISPRIZE**, v. *mĭs-prĭz'* [OF. *mespriser*, to disesteem, to condemn—from OF. *mes*, badly—from L. *minus*, less, and mid. L. *pretiārĕ*, to prize, to esteem—from L. *pretĭum*, a price]: in *OE.*, to slight; to under-value; to scorn; to despise; to mistake. **MISPRIS'ING**, imp. **MISPRISED'**, pp. *-prĭzd'*.

MISPRISION, n. *mĭs-prĭzh'ŭn* [OF. *mespris*, a neglect or contempt; *mesprison*, error, offense—from *mesprendre*, to mistake, to transgress—from OF. *mes*, badly—from L. *minus*, less, and mid. L. *prensĭōnem* for *prehensĭōnem*, a seizing]: in *law*, a term applied to all such high offenses as are under the degree of capital, but nearly bordering thereon: neglect, negligence, or contempt; mistake. *Note.*—**MISPRISION** was confused with **MISPRISE** in the sense of 'contempt,' from OF. *mespris*, 'contempt,' and thus '*misprision* of treason' was defined to be 'neglect or light account made of treason'; and again, '*misprision* of clerks' was 'neglect of clerks in keeping the state records' or records of courts of law—see *Skeat*.

MISPRIZE: see **MISPRISE**.

MISPRONOUNCE, v. *mĭs-prō-nōwns'* [*mĭs*, wrong, and *pronounce*]: to speak incorrectly; to pronounce wrongly. **MIS'PRONOUN'CING**, imp. **MIS'PRONOUNCED'**, pp. *-nōwnst'*. **MIS'PRONUN'CIA'TION**, n. *-nŭn'sĭ-ā'shŭn*, wrong or improper pronunciation.

MISPROUD, a. *mĭs-prowd'* [*mĭs*, wrong, and *proud*]: in *OE.*, viciously proud.

MISQUOTE, v. *mĭs-kwōt'* [*mĭs*, wrong, and *quote*]: to cite or quote incorrectly. **MISQUO'TING**, imp. **MISQUO'TED**, pp. **MIS'QUOTA'TION**, n. *-kwō-tā'shŭn*, the act of quoting wrongly; the wrong quotation itself.

MISRATE, v. *mĭs-rāt'* [*mĭs*, wrong, and *rate*]: to reckon or estimate incorrectly. **MISRA'TING**, imp. **MISRA'TED**, pp.

MISRECKON, v. *mĭs-rĕk'n* [*mĭs*, wrong, and *reckon*]: to compute incorrectly. **MISRECK'ONING**, imp. **MISRECK'ONED**, pp. *-rĕk'nd*.

MISREPORT, v. *mĭs-rĕ-pōrt'* [*mĭs*, wrong, and *report*]: to give an incorrect account of; to make a wrong report: N. a false or incorrect account of. **MIS'REPORT'ING**, imp. **MIS'REPORT'ED**, pp.

MISREPRESENT—MISREPRESENTATION.

MISREPRESENT, v. *mĭs-rĕp'rĕ-zĕnt'* [*mis*, wrong, and *represent*]: to represent falsely or incorrectly. MISREP'RESENT'ING, imp. MISREP'RESENT'ED, pp. MISREP'RESENTA'TION, n. *-zĕn-tā'shŭn*, a false or incorrect account given from mistake, carelessness, or malice; a softened expression for a lie or falsehood.

MISREPRESENTA'TION, in a legal view, or as usually termed, fraudulent M., is that kind of lie for which courts of law will give redress. It consists in a wilful falsehood as to some material thing connected or not with some contract; the object being that the party deceived should act upon it as true. The legal result is, that if the party so relying on its truth and acting on it suffer damage, he can sue the deceiver for such damage. It has sometimes been supposed that the deceit or misrepresentation must have reference to some contract, or arise out of some confidential relation between the parties, and that the party making it should have some private interest to serve; but this is a mistake; and recent cases have established, that if a person wilfully—i.e., either not knowing anything at all one way or the other about the matter, or knowing the facts, misrepresent something, with the intention that a stranger should act on such misrepresentation, and such stranger does so act on it, and suffer damage, then the right of action accrues to the deceived party. One remarkable exception to this doctrine, however, occurs in the case of the contract of marriage, where either party has in general no remedy whatever against the other for misrepresentations as to his or her property, connections, etc.; though there may be legal redress for an injured party in the case of a deceiver who by M. has prevented ascertainment of lack of chastity on the part of an intended wife, or of severe chronic disease in the case of either party to an intended marriage. It is not necessary that M. should be in writing to give ground for action, except in cases where the party gives representations as to the conduct, credit, ability, trade, or dealings of a third party, in order that such third party shall obtain credit, money, or goods, thereby. The doctrine of M. has acquired consequence of late, by the extension of the system of joint-stock companies, and the practice of the directors and officers publishing, or being parties to, fraudulent reports, accounts, and circulars as to the credit and stability of such undertakings. It is now settled, that not only every director, but every clerk in the service of the directors, who knowingly and wilfully concurs and takes a part in publishing or circulating such false reports, whereby strangers are led to believe and act on them, and thereby suffer pecuniary loss, is liable to an action of damages at the suit of such strangers. It is also a general rule affecting contracts (other than marriage), that M. in some material point bearing on the contract, and likely to induce the party to enter into such contract, will render the contract void; but in order to make M. of a minor sort have the same effect, the party

must warrant it as true; in which case, whether important or not, or whether wilful or not, a M. avoids the contract: this applies generally in contracts of life and fire insurance. Another important class of fraudulent misrepresentations, now brought within the criminal law to a large extent, is that of counterfeiting trade-marks: see TRADE-MARKS.

MISREPUTED, a. pp. *mīs'rě-pū'těd* [*mīs*, wrong, and *reputed*]: wrongly reputed.

MISRULE, v. *mīs-rôl'* [*mīs*, wrong, and *rule*]: to rule wrongly or badly: N. unjust rule; disorder; confusion. MISRU'LING, imp. MISRULED', pp. *-rôld'*. LORD OF MISRULE, the one who presided over Christmas sports.

MISS, n. *mīs* [from *mistress*, arising from a contracted way of writing it]: a title of address conferred on young unmarried women, prefixed to the name, as *Miss Brown* or *Miss Jane Brown*: a young girl: a kept mistress. MISSES, n. plu. *mīs'sěz*. MISSY, n. *mīs'sī*, a little miss. *Note*.—MISSES is (according to authorities generally) the plural of the noun *Miss*; in such an expression as *Miss Brown*, however, it is claimed by some that the word *Miss* is undoubtedly adjectival, and that the true plural form is therefore *Miss Browns*—on the ground that the expression *Misses Brown* is not only phonetically disagreeable, but also grammatically an adjectival character is assigned to *Brown*, the really significant name.

MISS, v. *mīs* [Icel. *missa*, to lose: Dut. *missen*, to fail, to miss: Dan. *misse*, to wink or blink]: to fail in hitting or reaching, as a mark; to fail in obtaining, finding, or keeping; to discover something to be wanting; to perceive the want of; to mistake; to omit; to be wanting: N. loss; want; mistake. MISS'ING, imp.: ADJ. lost; wanting; absent: N. the act of failing to hit the mark; in *OE.*, disappearance; loss. MISSED, pp. *mīst*.

MIS'SA DI VO'CÉ: in *singing*, the gradual swelling and again diminishing of the sound of the voice on a note of long duration.

MISSAL, n. *mīs'sāl* [F. *Missel*—from mid. L. *missālē*, Mass-book—from *missa*, the Mass, which see]: Roman Cath. ritual or Mass-book, the volume containing the offices used in celebration of the Mass. In the early western church, the Mass-book was called *Sacramentarium*, containing only a part of the present M. The volumes containing all the parts of service in high mass and low mass were called *Plenars*. Anciently, considerable variety in minor details prevailed among the books in use in different countries, and even in different churches of the same country. With the view of uniformity, the pope, in virtue of a decree of the Council of Trent, 1570, ordered that all churches which had not, for a clearly ascertained period of 200 years, had in uninterrupted use a peculiar service-book of their own, should thenceforth adopt the Roman M. Of this exemption, several churches in Germany, France, and even

in Italy, availed themselves; but in later times, the great majority have conformed to the Roman use. The Roman M. has twice since that date been subjected to revision and correction—1604 by Clement VIII., and 1634 by Urban VIII. The latter recension continues in use. The missals of the oriental rites differ from that of the Roman Church, each having for the most part its own proper form. See LITURGY.

MISSEEM, v. *mĭs-sēm'* [*mis*, wrong, and *seem*]: in OE., to make a false appearance; to misbecome. MISSEEM'ING, imp. misbecoming: N. a false appearance; disguise. MISSEEMED', pp. -*sēmd'*.

MISSEL, n. *mĭs'sĕl*: a bird of the thrush kind—so called from feeding on the berries of the *mistletoe*; also called MISTLE-THRUSH.

MISSELTOE: see MISTLETOE.

MISSEND, v. *mĭs-sĕnd'* [*mis*, wrong, and *send*]: to send amiss or incorrectly. MISSENT', pp. a. sent to the wrong or improper address.

MISSHAPE, v. *mĭs-shāp'* [*mis*, wrong, and *shape*: O. Dut. *misscheppen*, to misshape]: to give an ill form to; to shape ill. MISSHA'PING, imp. MISSHAPED', pp. -*shāpt'*. MISSHA'PEN, a. -*shā'pn*, ill-formed; ugly; deformed.

MISSILE, n. *mĭs'ĭl* [L. *missĭlĕ*, a missile—from *missĭlis*, that is thrown or cast—from *missus*, sent or thrown]: a weapon or thing thrown, or intended to be thrown, to hurt or injure, as a lance, a spear, a bullet, a stone: ADJ. that may be thrown or sent, as missile weapons.

MISSINNIP'PI RIVER: see CHURCHILL RIVER.

MISSION, n. *mĭsh'ŭn* [F. *mission*—from L. *missĭōnem*, a sending off—from *missus*, sent: It. *missione*]: state of being sent by authority on some special business; persons sent on some special business or with some particular object in view; purpose of life; message; a station of missionaries in a heathen country. In Rom. Cath. and other prelatical churches, a course of special Christian services held in a town or parish for a limited time, under the direction of the priest, but usually with the assistance of some one who has a gift for such services. It corresponds to the 'revival' in non-prelatical denominations. The themes are solemn; the preaching is pungent, earnest, practical, and awakening, presenting the fundamental truths of faith and repentance. A M. is held usually in Lent or in Advent. The prayers are sometimes extemporaneous, and the singing is generally congregational. In the Church of England, the M. has for years been largely developed and productive of great good: it has been introduced of late with wide acceptance in the Prot. Episc. Church in the United States. *Mission* in OE. is a discharge; a faction or party. MISSIONARY, a. *mĭsh'ŭn-ă-rĭ* [F. *missionnaire*]: pertaining to missions: N. one sent to preach the gospel to the heathen or the poor; one laboring to spread

MISSIONARY RIDGE—MISSIONS.

the gospel, especially among a neglected population, in connection with some church or society. **MISSIONER**, n. *mīsh'ūn-ēr*, for 'missionary,' in prelatical churches, a special preacher who conducts missions—analogue to a revivalist or 'evangelist.' **MIS'SIONARY-REC'TOR**, n. the title given to certain Roman priests in each diocese in England, from their having charge of missions more than ordinarily important.—**SYN.** of 'mission': errand; deputation; commission; delegation; embassy.

MIS'SIONARY RIDGE, BATTLE OF: see **CHATTANOOGA, BATTLES OF**.

MIS'SIONS, CHRISTIAN: enterprises of the Church of Christ for the conversion of the nations to Christianity, by sending to them preachers and teachers called *missionaries*.

The first Christians used great zeal in preaching the gospel to the heathen; Christian teachers continued to go forth for this purpose into heathen countries until about the 9th c.; and though other and less worthy means were too often employed, the labors of Palladius in Ireland, of Columba in Scotland, of Augustine in England, of Gallus and Emmeran in Alemannia, of Kilian in Bavaria, of Willibrod in Franconia, of Swidvirt in Friesland, of Siegfried in Sweden, of Boniface in Thuringia and Saxony, of Adalbert in Prussia, of Cyril and Methodius among the Slavonians, and of many such early missionaries, were unquestionably very instrumental in the extension of Christianity in Europe. After the Reformation, the Rom. Cath. Church, roused to activity by its losses and dangers, not only sent forth missionaries to confirm its adherents in Protestant countries, and to win back Protestants, but also sought to repair its losses by new acquisitions from the vast domain of heathenism. With this view, the *Congregatio de Propagandâ Fide* was constituted by Gregory XV. 1622, and the *Collegium de Propagandâ Fide* (see **PROPAGANDA**) by Urban VIII. 1627; and a number of institutions, called *seminaries*, were established for training missionaries. Jesuit missionaries earnestly prosecuted their work among the Indians of S. America, from the middle of the 16th c. to the middle of the 18th, when they were expelled by the Portuguese and Spanish governments, because their political power had become too formidable. They are accused of administering baptism to pagans with too great readiness; but they were certainly successful in extending civilization among the Indians, particularly of Paraguay. Jesuit missions to India and Japan were founded by Francis Xavier (q.v.) in the middle of the 16th c. In Japan, the missionaries made great progress at first; and in 1582 they boasted of 150,000 converts, 200 churches, and 59 religious houses of their order in that empire; but ere the middle of the 17th c., the whole work had been overthrown by severe and bloody persecution, and every missionary expelled. In China, similar rapid success was gained, and was followed by a similar period of persecu-

tion, though the destruction effected was less complete than in Japan, and the Church of Rome continued to subsist in China, its missionaries and members enduring great hardships, and many of them evincing their sincerity even by their death. There are not a few Rom. Cath. in China at the present day. In Abyssinia also, the Jesuits made much progress in the 17th c., and for a time attained great power in the country; but their interference in political matters led to their complete expulsion. In the 17th c., the Jesuits boasted of the vast success of their mission in Madura, a province of s. India; but it was found to be rather apparent than real, and to have been attained by a compromise of Christianity and the employment of unworthy means, so that, after long contests in the papal court, a decision was pronounced against the Jesuits, and their connection with Madura was dissolved in the middle of the 18th c. Rom. Cath. missions have from the first done much for the Indian tribes of N. America—especially on the Pacific coast, and in the more northern central and Atlantic regions. At the present day this work is not relaxed in vigor nor diminished in success.

For a long period after the Reformation, the Prot. Church seems to have been little sensible of the duty of laboring for the propagation of Christianity; nor was it until the 19th c. that missionary zeal began to be largely developed. In the middle of the 17th c. (1647), indeed, an act of the English parliament (the 'Long Parliament') established the *Society for Propagating the Gospel in Foreign Parts*; and in 1693 was established the *Society for Promoting Christian Knowledge*. A few missionaries from the early New England churches labored with zeal and success among the N. American Indians, in which field the names of Eliot and Mayhew are particularly distinguished in the 17th c., and that of Brainerd in the 18th; but the commencement of more systematic and continuous Prot. missionary enterprise may be reckoned from the establishment of the first Prot. mission to India, which did not take place till the beginning of the 18th c., when Bartholomew Ziegenbalg and another were sent thither by Frederick IV. of Denmark, and settled in a small territory, then belonging to Denmark, on the coast of Coromandel. The mission in s. India soon received the support of the English *Society for Promoting Christian Knowledge*, and was maintained and extended chiefly by that soc. during the whole of the 18th c. Among the missionaries in this field, the name of Schwartz is particularly distinguished; and his success, and the influence which he acquired in the country, were equally remarkable. He died 1798. Since that time, the missionary work in s. India has been carried on with continued success by numerous societies, European and American. Greater progress has been made there than in any other part of India: indeed, the work was not commenced in any other part till almost a century later.—The Moravian Church early entered on missionary enterprise, and was the first

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Prot. church which did so in its united or corporate character; and very successful missions of the United Brethren (their proper name) were planted in the 18th c. at the Cape of Good Hope, in the W. Indies, and in Labrador. Greenland had previously been the field of similar enterprise by missionaries from Norway. The mission to Greenland was founded by Hans Egede (q.v.) 1721, and has been maintained to the present day with such success that the greater portion of the Greenlanders have now been converted to Christianity, and much of the rudeness of their former life has disappeared.—Toward the close of the 18th c., some of the great missionary societies still existing in England were formed—the *Baptist Missionary Soc.* 1792, *London Missionary Soc.* 1795. About the same time, the *British and Foreign Bible Soc.* and the *Religious Tract Soc.* were formed, which have coöperated with all the missionary societies as most important auxiliaries. The *Baptist Missionary Soc.*, immediately after its formation, sent missionaries to n. India: Dr. Carey was one of its first, and also one of its most eminent (see CAREY, WILLIAM, D.D.). India is now a field of labor for many missionary societies, not only of Britain, but also of the United States and of the continent of Europe. The *London Missionary Soc.* was at first composed of members of almost all Prot. denominations; but the formation of other societies, and the engagement of churches as such in more denominational missionary enterprise—e.g., the Wesleyan Meth. Church, the Presb. Church—have left this soc. now almost entirely to the English Congregationalists, who administer it in a liberal spirit and with much energy. It sent its first missionaries to the South Sea Islands, and the mission was maintained for about 16 years, amid many difficulties, without any apparent success; but its success was afterward great, and rapid, first in Tahiti, later in other islands, so that now many islands of the South Seas are entirely Christian. The *London Missionary Soc.* soon entered other fields of labor, and now maintains missions to many parts of the world. In Madagascar amazing success has attended its work. One of the most important societies founded during the 19th c., the *Church Missionary Soc.*, formed by members of the Church of England, has sent forth missionaries to many fields. They have been particularly successful in New Zealand, w. Africa, and about Hudson's Bay; and they recently entered Abyssinia. The various churches in Scotland also support vigorous mission agencies. The late Dr. Livingstone, of the *London Missionary Soc.*, explored vast regions in central Africa. Fired by his example, the friends of missions in Scotland subscribed £12,000 to found *Livingstonia*, a memorial mission station on Lake Nyassa, under the management of the Free Church Foreign Missions Committee; and an expedition arrived there and established itself 1876. Various other missionary societies, Rom. Cath. and Prot., have selected stations in the region of the great lakes. The Wesleyan Methodists have missions in many parts

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of the world. They have been particularly successful in the Fiji Islands and in parts of w. Africa.

In the United States, the missionary societies rival those of Britain in magnitude and importance.—The *American Board of Commissioners for Foreign Missions* was formed by the Gen. Assoc. (Congl.) of Mass., at Bradford, 1810, the oldest soc. (for general missions) in the United States. It was formed by Congregationalists, but with a view to uniting the Presb. denominations also in the great work—thus not on a denominational basis. The Reformed (Dutch) Church withdrew, to prosecute its missions as a separate organization, 1838; and the Presb. constituency of the Amer. Board likewise withdrew 1870—leaving the soc., like the London Miss. Soc., practically Congl., though holding unchanged its original undenominational basis. One of the early enterprises of the Amer. Board was the mission to the Sandwich Islands, founded 1819, which has resulted in the general Christianization of these islands, and in their civilization to a degree which, considering the shortness of the time, is a notable achievement. The mission stations of the Amer. Board are in all parts of the world: specially notable has been their more than half-a-century of work in India. Their missions for many years in Turkey, and recently in Japan, have had great fruitfulness in gathering Christian converts and churches, and are recognized by statesmen as of immense social, economical, and political importance, through their gift to the people of new ideals of human character and life.—The *American Baptist Missionary Society* has occupied Burmah and the Eastern Peninsula as one of its principal spheres of labor, and there its missionaries have had probably the most remarkable success recorded in missionary annals, in the Christianization and civilization of the people called Karens, and, within a few years, of other Indian peoples. The missionaries of the Prot. Episc. Church have brought great blessings to many of the Indian tribes in the far west.

On the continent of Europe, the first Prot. missionary soc. was that of Basel 1816; the next was that of Berlin 1823; and some of these have also maintained successful missions in heathen countries.—The most marked and extensive success of missions, besides those above noticed, is in Madagascar, where missionaries of the London Missionary Soc. early had the protection and favor of King Radama I., and the church planted by them continued to exist, notwithstanding most bloody persecution, and the martyrdom of tens of thousands of its members, during the next reign under a heathen queen: it is a wonderfully flourishing church at the present day, numbering among its members the reigning queen and her chief ministers of state, and having immense churches at the capital city. In s. Africa, also, important results have been attained. Access has recently been obtained to China, and a number of Prot. churches and societies have entered energetically upon that field. Preparation

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had been previously made for this, by missionary labors among the Chinese in the Eastern Peninsula, and by the study of the language, the compilation of grammars and dictionaries, and the translation of the Bible into the Chinese language. Indeed, it must be reckoned as among the services rendered to mankind by Christian missionaries, in modern times, that they have not only translated the Bible and other religious books into many languages, but have reduced many barbarous tongues to writing, and have prepared grammars and dictionaries, thereby contributing not a little, independently of their highest aim, to the promotion of knowledge, civilization, and the welfare of the human race.—One of the important features of recent years in missionary work, is the formation, rapid growth, and large results of *Women's Missionary Societies*: these, not excluding the general work, devote their efforts mainly to reaching with uplifting power the benighted and wretched women of heathen lands. This work is one of great significance.

The progress of Christian missions to Mohammedan countries has hitherto been very small, though numerous converts from Mohammedanism, as well as from heathenism, have been made in India. Of late, some have thought they observed a movement among the Mohammedans of India, apparently tending toward Christianity; but at the same time there has been a new awakening of Mohammedanism itself in the Eastern Peninsula and the islands of the Malayan Archipelago. Missions to the Jews have for several years engaged not a little of the attention of some portions of the Christian Church, particularly in England and Scotland. Missions have been planted in places where Jews are numerous, and after many unfruitful years seem entering of late on a period of success.

Christian missions have passed through the era of experiment, and are rapidly emerging from the cloud of suspicion or contempt which at first was cast about them. It is evident that if the rate of advance in the last decade, in three or four important national mission-fields, be continued, the decades will not be very many before Christ will have been preached in all the world.

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MISSISSIPPI, *mĭs-ĭs-sĭp'ĭ*: a state; one of the U. S. of America; 7th in order of admission into the Union; 18th in population 1880, 21st in 1890, and 20th in 1900; in 1902, 3d in production of cotton (1,451,626 bales) and 20th in corn. Popularly known as the 'Bayou State.' The name is Indian, meaning 'Father of Waters.'

Location and Area.—M. is in lat. $30^{\circ} 13'$ — 35° n., long. $88^{\circ} 7'$ — $91^{\circ} 41'$ w.; bounded n. by Tenn., e. by Ala., s. by the Gulf of Mexico and La., w. by La. and Ark.; extreme length n. and s. 332 m., extreme breadth 189 m., mean breadth 142 m.; 46,810 sq. m. (29,958,400 acres); total gulf-coast 287 m.; greatest elevation 800 ft.; cap. Jackson.

Topography.—The surface is generally undulating, with numerous hills and a broad, low ridge extending n. and s. through the state, the whole face sloping gradually toward the Mississippi river and the Gulf of Mexico from the rugged limestone region in the n.e. E. of the central ridge are broad tracts of fertile prairie, which yield large crops of corn and cotton, and w. are a number of valleys between low ridges that extend from the central ridge to the great M. 'bottom,' or Yazoo basin, an elliptical area extending from Vicksburg n. to Tenn., and embracing on the e. the valley of the Yazoo and Tallahatchee rivers. It is more than 50 m. wide in the centre, comprises about 4,000,000 acres, is swampy and frequently inundated, and is the centre of the cotton-zone of the state. 'Cane hills' or 'bluffs' occupy the country along the Mississippi river below Vicksburg, for 10 or 15 m., some of which are 150 ft. above the river; and a broad belt of timber-land with extremely fertile tracts extends along the river below the Yazoo delta, but, like the 'bottom,' is subject to overflow. Extensive marshes prevail at the mouths of the streams entering the gulf. The Mississippi river forms the w. boundary for more than 500 m. by its windings, and the Tennessee river the n.e. boundary for 15 m. The main drainage is by the Mississippi river and its affluents, the Homochitto, Bayou Pierre, Big Black, and Yazoo rivers; the Sunflower, which connects the Mississippi with the Yazoo; the Tallahatchee and Yalabusha, which form the Yazoo; the Pearl and Pascagoula, with their branches, the Bogue Chitto, Leaf, and Chickasawha, which enter the gulf; and the Tombigbee, with its numerous affluents in the e. The Yazoo is navigable throughout, and its affluents for considerable distances; the Big Black is navigable by steamers for 50 m. above its mouth; the Pearl may be ascended by small boats for 100 m. from its mouth; and the part of the Tombigbee in M. is navigable for 10 m. Large sums have been expended by the federal and state govts. in building levees along the Mississippi river to prevent overflows; yet spite of annual strengthenings, breaks frequently occur leading to disastrous overflows, as in 1890, Mar. and Apr.

Climate.—The summers are long and hot; winters

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short, and colder than on the Atlantic coast in the same latitude; most temperate and agreeable climate from Oct. to July. Excepting the lowlands of the water-courses and the malarial 'bottom,' the state is generally healthful, with temperature at Vicksburg 47° — 56° in winter and 80° — 83° in summer, and rainfall at Natchez 54 in., along the coast 64 in., and average for the state $57\frac{3}{4}$ inches. The rainfall is quite equably distributed through the year, insuring a marked uniformity in amount of agricultural products.

Geology.—The limestone formation of s.w. Tenn. extends a considerable distance in the n.e. corner of M., cropping out in massive walls on both sides the Tennessee river. This is succeeded, on the w., first by the cretaceous, then by the tertiary formations, the latter comprising 7 groups: the n. lignite, siliceous Claiborne, calcareous Claiborne, Jackson, Vicksburg, Grand Gulf, and coast Pleiocene. The quaternary or alluvial predominates in the 'bottom,' the lowlands of the Miss., Sunflower, and Yazoo rivers and their tributaries, and for a distance of 30 m. back from the gulf-coast. The orange sand, a notable feature of the geology of M., is found in various shades in different localities, and in some places is sufficient in mass and solidity to furnish substantial building-stone. The economic provisions are chiefly brown coal, mineral fertilizers, potters' and fire-brick clay, and rotten limestone for burning. The mineral deposits are of slight consideration, though there are numerous medicinal springs of alkaline and saline chalybeates, containing iron, lime, magnesia, and some soda.

Zoölogy.—Wild animals are plentiful in the wooded districts, and include bears, foxes, wolves, wild cats, panthers, deer, and various small game—e.g., rabbits, squirrels, gophers, and wood-rats. Teal, brant, wild pigeons, wild turkeys, quail, mocking-birds, and rice-birds abound. The swamps and bottom-lands abound in lizards, water-snakes, rattle-snakes, and moccasins; and the bayous of the Mississippi river in alligators. The principal streams contain abundance of fish—e.g., giant cat-fish, buffalo-fish, black bass, pickerel, and many others common to n. waters; and oysters and other shell-fish are taken in large quantities from Mississippi Sound.

Agriculture.—In 1889 (census 1890) the number of farms was 144,318, with a total average of 17,572,547 acres, or 122 acres per farm. Of this 6,849,390 acres were improved and 10,723,157 unimproved. The value of land, fences, and buildings was \$127,423,157; implements and machinery \$5,968,865; live stock on hand June 1, \$33,936,435; farm products of the year \$73,342,995. Among these products were: Indian corn 26,148,144 bu., oats 1,362,290 bu., cotton 1,154,725 bales, cane molasses 1,524,024 gals., sorghum molasses 972,216 gals., cane sugar 67,860 lbs., hay 85,054 tons, rice 676,746 lbs., Irish potatoes 362,726 bu., sweet potatoes 3,207,125 bu., wool 1,038,186 lbs., milk 50,803,371 gals., butter 12,988,637 lbs. In 1900 the farms numbered 220,803, comprised 18,240,736 acres, of which 7,594,428 were improved and 10,646,308 unimproved, and were

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valued, with improvements, implements, machinery, and live stock, at \$204,221,027.

Manufactures.—M. had (1890) 1,698 manufacturing establishments, with \$14,896,884 capital, employing 15,817 hands, paying \$4,913,863 in wages, requiring \$10,064,897 in materials, and yielding \$18,705,834 in products. The leading industries were: lumber, rough, establishments 338, employees 4,434, wages \$1,287,391, materials \$2,852,530, products \$5,670,774; lumber, planing-mill products, establishments 8, employees 103, wages \$53,121, materials \$59,170, products \$136,450; flouring and grist mill products, establishments 408, employees 980, wages \$125,293, materials \$1,009,335, products \$1,249,669; cotton goods, establishments 9, employees 1,184, wages \$290,981, materials \$871,970, products \$1,333,398; cotton-seed oil and cake, establishments 13, employees 921, wages \$242,995, materials \$1,757,807, products \$2,406,628; woolen goods, establishments 7, employees 1,082, wages \$306,270, materials \$508,039, products \$924,185; foundry and machine-shop products, establishments 18, employees 291, wages \$168,244, materials \$307,257, products \$591,951; brick and tile, establishments 33, employees 696, wages \$134,073, materials \$61,643, products \$295,939; fertilizers, establishments 3, employees 58, wages \$13,248, materials \$277,005, products \$326,650. In 1900 there were 4,772 manufacturing establishments, with \$35,807,419 capital, and products valued at \$40,431,386.

Commerce.—M. and La. comprise one U. S. internal-revenue dist., with headquarters in New Orleans; and M. has 3 customs stations—Natchez, Vicksburg, and Bay St. Louis (see LOUISIANA, *Commerce*). In internal-revenue collections M. is joined with Louisiana; total collections (1902) \$2,453,925.

Railroads.—The growth of the railroad system of M. is thus shown: 1842 there were 26 m. in operation; (1846) 42; (1850) 75; (1855) 278; (1860) 862; (1865) 898; (1870) 990; (1875) 1,018; (1882) 1,231; (1888) 2,117; (1890) 2,471; (1893) 2,459; (1895) 2,498; (1901) 3,044. In 1895 total cap. invested was \$60,947,542, gross earnings \$1,666,565, net earnings \$308,350, interest paid \$269,574, dividends \$7,600.

Religion.—In 1885 the Bapt. was the largest denomination in M., having 1,530 churches and 146,185 members. It was followed by the Meth. Episc., South, 51,702 members; Meth. Episc., 26,251 members; Meth. Episc., colored branches, 250 churches, 13,060 members; Presb., 180 churches, 7,209 members; Cumberland Presb., 3,931 members; and 9 others varying from 2,000 to 100 members. In 1890 M. had 5,186 church organizations, 5,001 church buildings, seating 1,330,542, worth \$4,390,173, and 430,557 church members, or 33.39 per cent. of the total population. The leading churches were: Bapt. (South), 1,125 organizations, 1,071 churches, value \$689,451, and 82,315 members; Bapt. (colored), 1,385 organizations, 1,333 churches, value \$682,541, and 136,647 members; Prim. Bapt., 127 organizations, 122 churches, value \$46,550, and 3,910 members; Meth. Episc., 398 organizations, 388 churches, value \$245,624,

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and 31,142 members; Meth. Episc. (South), 903 organizations, 854 churches, value \$913,563, and 74,785 members; African Meth., 480 organizations, 598 churches, value \$481,507, and 54,145 members; Prot. Meth., 75 organizations, 73 churches, value \$16,175, and 3,147 members; Presb. (South), 208 organizations, 174 churches, value \$415,315, and 11,055 members; Cumberland Presb., 139 organizations, 120 churches, value \$110,475, and 6,631 members; Prot. Episc., 68 organizations, 61 churches, value \$322,960, and 3,560 members; Rom. Cath., 67 organizations, 60 churches, value \$321,525, and 11,348 members; Disciples of Christ, 111 organizations, 69 churches, value \$55,422, and 5,729 members.

Education.—1889, May 17, the state supt. of instruction reported that public education was steadily advancing; that within two years more than \$200,000 had been expended on school buildings, some towns having erected buildings for graded schools that cost \$25,000 and \$30,000 each; that nearly all towns of 1,500 pop. and over had graded schools in session 7 to 10 months annually, and several counties had 6 months of free school in the country districts; and that an educational revival was not far in the future. In 1895 M. had an estimated school population (5–18 years) of 522,508, school census of school population (5–21 years) in 1894, 541,531. The school enrollment (1895) was 315,615, or 67.1 per cent. of those of school age; average daily attendance 202,683, or 57.8 per cent. of those enrolled; average number of days taught 105.4, total days taught 20,390,426, or 39 days to each person of school age and 58.2 to each pupil enrolled. There were 7,855 teachers employed (3,647 male and 4,208 female); number of school houses 6,264, value \$1,636,055; receipts, from permanent funds \$77,946, taxation \$1,099,756, other \$44,706, total \$1,222,408; expenditures, for sites, buildings, and furnishings \$37,314, salaries \$1,108,013, other \$127,173, total \$1,272,500, or \$6.28 per pupil. Of public high schools there were 87, having 164 teachers (97 males, 67 females), secondary students 3,171 (males 1,438, females 1,733), students below secondary grades 13,076 (6,344 males, 6,732 females); students preparing for college 823, in classical course 490, scientific 333; graduates (1895) 164, of whom 141 were preparing for college; libraries (22 schools) 8,900 vols.; total income (79 schools) \$142,393. There were 74 private schools for secondary instruction, with 181 instructors, 3,446 secondary students (1,564 males, 1,882 females), and 4,977 elementary pupils (2,340 males, 2,637 females). Normal schools were maintained at Holly Springs (state) and Tougaloo (dept. of Tougaloo Univ.). These had 6 instructors, 137 pupils enrolled, 3,500 vols. in the libraries, apparatus valued at \$1,300, grounds and buildings valued at \$70,000, receipts from public sources \$4,000, and other sources \$9,000. The institutions for the superior instruction of women (13) were: Blue Mountain Female College (non-sect.), Blue Mountain; White-worth Female College (Meth. Episc., S.), Brookhaven; Central Female Institute (Bapt.), Clinton; Industrial Institute and College for the Education of White Girls

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of M. (non-sect.), Columbus; Corinth Female College, Corinth; Franklin Female College (non-sect.), Holly Springs; East M. Female College (Meth. Episc., S.), Meridian; Union Female College (Cumb. Presb.), Oxford; Chickasaw Female College (Presb.), Pontotoc; Port Gibson Female College (Meth. Episc., S.), Port Gibson; Shuqualak Female College (Bapt.), Shuqualak; Starkville Female Institute (Bapt.), Starkville; and Lea Female College (Bapt.), Summit. The public-school system was radically changed and improved 1886, small schools were consolidated, uniform examinations and institutes for teachers were established, and personal fitness, and character and amount of work, were made the basis of teachers' salaries. The State Normal School was reorganized the same year, and placed under the jurisdiction of the state supt. of instruction.

The Agricultural and Mechanical College of the State of M., and the Alcorn Agricultural and Mechanical College, both endowed with the national land grant, had (1887-8) 24 professors and instructors, 524 (13 female) students, 5,841 vols. in the libraries, apparatus valued at \$17,827, productive funds \$212,150, income therefrom \$10,608, state appropriation \$21,409, total income, excepting board and lodging, \$32,392. The first institution maintains an agricultural experimental station, and the second is open to colored students. The colleges of liberal arts (4) were: M. College, Clinton, chartered 1850 (Bapt.), Rev. W. S. Webb, D.D., pres.; Rust University, Holly Springs, 1869 (Meth. Episc.), Rev. Charles E. Libby, PH.D., pres.; Kavanaugh College, Holmesville, 1885 (Meth. Episc.), Rev. H. Walter Featherstun, pres.; and the Univ. of Mississippi (formerly Oxford Univ.), 1844 (non-sect.), Edward Mayes, LL.D., chairman of faculty. The Univ. of M. comprises two general depts.: a dept. of science, literature, and arts, and a dept. of professional education, with one professional school—that of law. The univ. is especially strong in the dept. of modern languages, and since 1882 has admitted women on the same conditions as men. It had (1887-8) 14 professors and instructors, 229 students, 4-years' course, 13,500 vols. in the library, scientific apparatus valued at \$100,000, grounds and buildings valued at \$300,000, productive funds \$544,000, and income therefrom \$32,643. This institution also was reorganized 1886, with more satisfactory courses of instruction: 232 students were enrolled 1889. In 1895 the univ. of M. had 12 instructors (11 male and 1 female), students in college department 166 (141 male, 25 female), in graduate school 27 (23 male, 4 female), in professional departments 40, total 233 (204 male, 29 female). The univ. had 5 scholarships and 3 fellowships, library 14,000 vols., value of scientific apparatus \$100,000, buildings and grounds \$240,000, productive funds \$564,000; income from fees \$5,000, productive funds \$32,643, total \$39,093.

Illiteracy.—Persons 10 years of age and over enumerated (1890) 902,028, of whom 360,613, or 40.0 per cent., were illiterates; male population 10 years of age and over 451,-

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788; illiterates 170,761, or 37·8 per cent.; female population 10 years of age and over 450,240, illiterates 189,852, or 42·2 per cent.; total white population 10 years of age and over 385,099, illiterates 45,755, or 11·9 per cent.; native white population 10 years of age and over 377,466, illiterates 44,987, or 11·9 per cent.; foreign whites 10 years of age and over 7,633, illiterates 768, or 10·1 per cent.; colored population 10 years of age and upwards 516,929, illiterates 314,858, or 60·9 per cent.

Finances and Banking.—In 1890 the assessed value of all taxable property was \$166,772,279, true value \$454,242,688, of which \$208,393,024 was real estate; the *ad valorem* taxation was \$2,803,337, or \$2·17 per capita and \$1·68 per \$100 of assessed valuation. The total debt, less sinking fund, was \$6,011,347, or \$4·66 per capita; of this \$3,503,009 was state, \$1,230,299 county, and \$1,278,039 municipal; interest per annum \$193,400, or 5·99 per cent. On July 1, 1896, the total state debt was \$2,641,201, of which a large portion was held by various state funds, drawing interest at from 4 to 6 per cent. The assessed valuation (1902) of real est. was \$145,719,108, personal prop. \$64,647,897, total \$240,989,126, tax rate \$6 per \$1,000. On Oct. 31, 1902, M. had in operation 17 nat. banks, with a capital stock of \$1,530,000, U. S. bonds on deposit \$1,177,000, circulation outstanding \$1,234,100, 127 State banks and 10 private banks; loans and discounts, \$2,034,330.

History.—Hernando De Soto (q.v.) and his Spanish companions are believed to have been the first European visitors to the region of the present state of M. They traversed the old Chickasaw country 1539, spent a year or more in the present Yazoo 'bottom,' reached the Mississippi river 1541, and separated on their leader's death 1542, without having made any settlements. In 1673 Jacques Marquette (q.v.) and Louis Joliet (q.v.), attempting to reach the mouth of the Mississippi river, made several temporary landings within the present limits of M.; and 1682 Robert La Salle (q.v.) and the Chevalier de Tonti (q.v.) spent some time among the Natchez Indians while on La Salle's second expedition to the Mississippi mouth. Sixteen years after La Salle had taken possession of the region in the name of France, and called it Louisiana in honor of the king, Pierre le Moyne, Sieur d'Iberville (q.v.), received royal permission to attempt to colonize the new territory. With 200 French immigrants he entered Mobile Bay 1699, Jan. 1, discovered Pascagoula river, landed on Ship Island, and built a fort at the Bay of Biloxi, 80 m. e. of the site of New Orleans. Iberville ascended the Mississippi river as far as Natchez, returned to France, collected a second and larger colony, secured a milit. force, and built a fort and established a colony at Natchez (Fort Rosalie) 1716. The Biloxi settlement was soon abandoned, but the establishment of colonies at New Orleans, Haynes Bluff, the Bay of St. Louis, Pascagoula, and other points, attracted many immigrants and adventurers to the region. In 1718 all the colonies became subject to the company formed by John

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Law (q.v.) to carry out his great 'Mississippi Scheme; and when that enterprise failed, the whole territory of La. passed to the control of the Company of the Indies. Under this management, efforts were made to concentrate the strength of the French settlers in New Orleans, and, while that settlement began to attain importance, the smaller ones in M. suffered from lack of attention and protection. In 1728 the new French gov. fomented trouble with the Choctaw and Natchez Indians, who hitherto had been friendly with the whites, and they and several smaller tribes united to drive the French from the entire territory. Fort Rosalie was attacked 1729, Nov. 29, and the other settlements in M. about the same time; but the successes of the Indians were checked by a milit. force sent from New Orleans 1730. In 1733 the Company of the Indies surrendered its interests and control in the region to the French king, and when Gov. Bienville was reinstated he found the colonists involved in a bitter war with the Chickasaw Indians, who as friends of the English had hated the French from their arrival. This war lasted several years, comparative peace prevailed 1743-52, and further trouble with the Indians broke out 1752. The part of La. including what is now M. was ceded by France to Great Britain 1763, and for several years the principal settlers were the English from the Atlantic coast colonies. The U. S. govt., having succeeded to the rights of the English in the region, formed the terr. of M. 1798, Apr. 7. It was then bounded n. by a line drawn e. from the mouth of the Yazoo river to the Chattahoochee, e. by the Chattahoochee, s. by the 31st parallel, w. by the Mississippi river. 1804, Mar. 27, a portion of the region ceded to the govt. by Ga. was added, making the terr. comprise the present states of Ala. and M. n. of the 31st parallel; and the part s. of that parallel, between the Pearl and Perdido rivers, was incorporated 1812, May 14. In 1817, Mar., Ala. was separated from M. terr., and, in Dec. following, M. was admitted into the Union as a state. The first constitution was in force till 1832, when a second was adopted. On the election of Pres. Lincoln 1860, a state convention was called, which adopted an ordinance of secession 1861, Jan. 9, and ratified the constitution of the Confederacy Mar. 30, without submitting the question to popular vote. The state promptly furnished its quota of troops for the Confederate army, and during the civil war suffered severely, particularly in the n. counties. Biloxi was captured by federal troops and a battery was removed from Ship Island 1861, Dec. 31; the battle of Shiloh was fought near the M. border, after which the Confederates retired to Corinth, which was captured by the federal troops 1862, May 30; a battle was fought near Iuka Sep. 19; the Confederates attacked Corinth, but were repulsed Oct. 3, 4; Vicksburg was captured by the Union army, after important milit. operations and a remarkable siege, 1863, July 4; the capital was captured by the Union army; and, among others, two raids were made on Meridian. After

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the close of the war, the state authorities undertook to reorganize the state govt., but Pres. Johnson appointed William L. Sharkey provisional gov., and he called a convention, which amended the state constitution by abolishing slavery 1865, Aug. 21, and repealed the ordinance of secession the following day. State officers, congressmen, and a legislature were elected Oct. 2, and U. S. senators on the meeting of the legislature; but neither senators nor congressmen were admitted to their seats. During the reconstruction period, the state was under the milit. command of Gens. E. O. C. Ord, A. C. Gillem, Irwin McDowell, and Adelbert Ames. It was readmitted to the Union 1870, Feb. 23, and the state authorities assumed control Mar. 10, following.

Government.—The executive authority is vested by the constitution (1869) in a gov. elected for 4 years, salary \$4,000 per annum; the legislative in a general assembly, comprising a senate of 37 members elected for 4 years, and a house of representatives of 120 members elected for 2 years, salary of each \$400 per annum, biennial sessions; and the judicial in a supreme court, comprising a chief-justice and 2 associate justices appointed by the gov. for 9 years, salary of each \$3,500 per annum, a circuit court in each of 15 judicial districts, each with a single judge appointed for 6 years, a chancery court in each of 20 chancery districts, each with a chancellor appointed for 4 years, and justices of the peace elected for 2 years. The lieut.gov. receives \$800 per annum; sec. of state \$2,500; treas. \$2,500; auditor \$2,500; atty.gen. \$2,500; supt. public education \$2,000; commissioner of agriculture \$1,000; land commissioner \$1,000; adjt.gen. \$500; librarian \$800; 2 U. S. district judges \$3,500 each; and collector of internal revenue \$2,750. By the constitution, treason, murder, and arson committed in the night are punished with death; married women may convey and devise property belonging to them at the time of marriage or acquired subsequently, are not liable for debts of their husbands, and may do business as if unmarried; the state cannot become a stockholder in any corporation or association, nor pledge nor lend its credit to any corporation, association, or individual; no one who denies the existence of a Supreme Being, or who is not a qualified elector, can hold office; and the chief grounds of divorce are adultery, sentence to penitentiary, desertion for two years, habitual drunkenness, and cruel treatment.

The successive govts., with their terms of service, are as follows: *Terr.*—Winthrop Sargent 1798–1802; William C. Claiborne 1802–05; Robert Williams 1805–09; David Holmes 1809–17. *State*—David Holmes 1817–19; George Poindexter 1819–21; Walter Leake 1821–25; David Holmes 1825–27; Gerard C. Brandon 1827–31; Abraham M. Scott 1831–33; Hiram G. Runnels 1833–35; Charles Lynch 1835–37; Alexander G. McNutt 1837–41; Tilghman H. Tucker 1841–43; Albert G. Brown 1843–48; Joseph W. Matthews 1848–50; John A. Quitman 1850–1; John J. Guion (act'g) 1851; James Whitfield 1851–

2; Henry S. Foote 1852-54; John J. MacRae 1854-58; William McWillie 1858-60; John J. Pettus 1860-62; Jacob Thompson 1862-64; Charles Clarke 1864-5; W. L. Sharkey (provisional) 1865-6; Benjamin G. Humphreys 1866-70; James L. Alcorn 1870-1; Ridgley C. Powers 1871-74; Adelbert Ames 1874-76; John M. Stone 1876-82; Robert Lowry 1882-90; John M. Stone 1890-96; A. J. McLaurin, 1896-1900; A. H. Longino, 1900-04.

Counties, Cities, and Towns.—M. is divided into 75 counties. In 1880 the most populous *counties* were: Hinds 43,958; Yazoo 33,845; Warren 31,238; Noxubee 29,874; Marshall 29,330; Panola 28,352; Lowndes 28,244; Holmes 27,164; Madison 25,866; Washington 25,367; De Soto 22,924; Adams 22,649; and Lee 20,470; *cities and towns*: Vicksburg 11,814; Natchez 7,058; Jackson 5,204; Columbus 3,955; Yazoo City 2,542; Holly Springs 2,370; Aberdeen 2,339; Corinth 2,275; Water Valley 2,220; and Greenville 2,191. In 1890 the leading *counties* were: Washington 40,414; Hinds 39,279; Yazoo 36,394; Warren 33,164; Holmes 30,970; Noxubee 27,338; Madison 27,321; Marshall 26,043; and Adams 26,031; *cities and towns*: Vicksburg 13,373; Natchez 10,101; Greenville 6,658; Jackson 5,920; Columbus 4,559; Aberdeen 3,449.

Politics.—State, congressional, and presidential elections are held Tuesday after first Monday in Nov. Idiots, insane, and criminals are excluded from voting. The state govt. (1890) is wholly democratic as to state officers and nearly so as to the legislature. M. has 9 electoral votes. Her votes for pres. and vice-pres. have been as follows: 1820, James Monroe and Daniel D. Tompkins, 2 each, 1 vacant; 1824, Andrew Jackson and John C. Calhoun 3; 1828, Andrew Jackson and John C. Calhoun; 1832, Andrew Jackson and Martin Van Buren 4; 1836, Martin Van Buren and Richard M. Johnson; 1840, William Henry Harrison and John Tyler; 1844, James K. Polk and George M. Dallas 6; 1848, Lewis Cass and William O. Butler; 1852, Franklin Pierce and William R. King 7; 1856, James Buchanan and John C. Breckinridge; 1860, John C. Breckinridge and Joseph Lane; 1864, no vote; 1868, no vote; 1872, U. S. Grant and Henry Wilson 8; 1876, Samuel J. Tilden and Thomas A. Hendricks; 1880, Winfield S. Hancock and William H. English; 1884, Grover Cleveland and Thomas A. Hendricks 9; 1888, Grover Cleveland and Allen G. Thurman, 9; 1892, Grover Cleveland and Adlai E. Stevenson, 9; 1896, William J. Bryan and Arthur Sewall, 9; 1900, William J. Bryan and Adlai E. Stevenson.

Population.—(1800) white 5,179, free colored 182, slave 3,489, total 8,850; (1810) white 23,024, free colored 240, slave 17,088, total 40,352; (1820) white 42,176, free colored 458, slave 32,814, total 75,448; (1830) white 70,443, free colored 519, slave 65,659, total 136,621; (1840) white 179,074, free colored 1,366, slave 195,211, total 375,651; (1850) white 295,718, free colored 930, slave 309,878, total 606,526; (1860) white 353,899, free colored 773, slave 436,631, total 791,305; (1870) white 382,896, free colored 444,201; total 827,922; (1880) 1,131,597; (1890) 1,289,000; (1900) 1,551,270.

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MISSISSIPPI RIVER: chief river of N. Amer. and greatest artery of internal commerce in the world, involving a system of 35 rivers, to which it is the trunk, and 15,000 m. of inland navigation, with the drainage of a vast breadth of the United States, 1,147,000 sq. m., between the Alleghany and Rocky Mts. The chief upper branches of the system are the Missouri river on the n.w., with drainage area of 518,000 sq. m.; the Ohio on the n.e., with drainage area of 214,000 sq. m.; and the upper M., with drainage area of 169,000 sq. m. The respective lengths of these three are—Missouri 2,908 m.; Ohio 1,265 m.; upper M. 1,330 m. (above the mouth of the Missouri). It thus appears that the upper M. is hardly more of a stream than the Ohio, and that it and the Ohio together do not nearly equal the Missouri. The turbid water of the trunk stream, moreover, from its mouth n. for 1,286 m., is found to be continuous with the water of the Missouri, and not with the clear water of the upper M. The true river, in fact, which opens a water-course n. 2,206 m., to the falls of St. Anthony, and into the n.w. 3,860 m., to the Great Falls of the Missouri, would be properly known as the Missouri, if volume, length, and the character of the stream dictated the name. The fact of continuity of direction with the trunk stream, from the Gulf n., has caused the upper M. to be viewed as the extension of the trunk, and entitled to give its name to the whole stream.

The earliest European discovery of the M. was by De Soto, 1541, June, not far from the site of Helena, Ark. Marquette and Joliet descended the Wisconsin river to the M., which they entered 1673, June 17, and sailed down nearly to the Gulf. La Salle entered it from the Illinois river 1682, and descended to the Gulf. He set up a column there, with the Fr. arms, 1682, April 9, and claimed possession, for the Fr. king, of the vast territory reached by the great river and its branches. The highest source of the upper M. was fixed by Schoolcraft's explorations, 1832, in Lake Itasca (q.v.), from which the river issues in a stream 10 or 12 ft. wide and 18 in. deep. Later explorations carried the highest point two m. or more beyond, or s. of, Itasca, and Capt. Willard Glazier, 1881, July 22, reached a higher smaller head-water which he named Lake Glazier (q.v.), from which a stream flows n. a mile or two into Itasca. Explorers since, however, have asserted that Capt. Glazier mistook the long-known Elk Lake for a new discovery. He estimated this to be 1,582 ft. above sea-level, and 5,184 m. from the mouth of the M. Col. H. L. Abbot's estimate of the distance between the mouth and source of the M. is 2,616 m: the elevation of the source he puts at 1,680 ft. Hopewell Clarke, long a land-explorer for the N. Pacific R.R. Co., was chief of an exploring expedition to discover the sources of the M. 1886. Its results are given in *Science*, VIII. (1886, Dec. 26). They show that Nicollet's creek is far the largest affluent of Itasca, contributing about three-fourths of the regular perennial inflow; it is

also the longest—its windings being taken into account: it is also the most elevated—having been traced beyond what Nicollet saw of it, to a little lake 92 ft. above the level of Lake Itasca: thus, as Nicollet says—‘This creek is truly the infant Mississippi.’ Its head is in a narrow lake about half-a-mile long, whose head is in the n.w. of quarter-section 34, tp. range 143. Out of this lake the stream flows northward, 18 inches wide, 12 inches deep. The locality is in that part of Minn., Becker co., lat. $47^{\circ} 10'$ n., long. $95^{\circ} 2'$ w., which is very near the centre of the continent, and where the three greatest river systems of N. Amer. originate: that of the Red river of the north, that of the great lakes and the St. Lawrence, and that of the M. At the extreme head-waters of the Missouri, the M., and the Ohio, water falling on a single sq. m. may take opposite courses to the sea. The course of the M. from Itasca is e. of n., but, as it proceeds, a circuit is entered upon, going generally e., but with large bends and a very devious stream, through Bemidji, Cass, and Winibigoshish lakes, which are the most n. head-waters of the great river; thence s.e., past the falls of Pokegama, to a point where Swan river enters, 998 m. above the mouth of the Missouri; thence s. for some distance, to a point opposite to the w. end of Lake Superior; and thence s.w., to a bend back toward the e., where the circuit ends, and from which the river begins the long stretch, generally s.e., from abt. 130 m. above St. Paul to a turn s.w., at a point half-way between Dubuque and Rock Island, and w. of Chicago, distant 138 m. Just at the end of its great circuit, and at the head of its long s.e. stretch, the river receives a branch almost as large as itself, the Crow Wing river, which brings in from the n.w. a drainage corresponding to that gathered by the M. from the n.e. and n. The M. is wholly within Minn. for 663 m., and is its w. boundary for 134 m. further. Of this 797 m., navigation extends 540, with the break at the falls of St. Anthony. These falls have a single descent of 18 ft. only, over a sandstone cliff; but with rapids both above and below, the descent is 65 ft. within three-quarters of a mile. A line of steamers above the falls runs to St. Cloud, 86 m., and very much further when high water favors. Below the falls, navigation is regular through 2,200 m. to the Gulf. The Rock Island rapids, 14 m. in length, next above the cities of Rock Island and Davenport, and the Des Moines rapids, 130 m. lower down and 12 m. long, have required elaborate improvement to secure good navigation. For the season of low water, the entire upper M. is, in fact, difficult for boats, on account of the frequent sand-bars. The upper M. is joined by the larger and turbid Missouri, 1,286 m. above the Gulf of Mexico, 189 m. above Cairo, at the mouth of the Ohio, and 16 m. above St. Louis. It proceeds abt. 159 m. further, to the head of the broad alluvial basin which extends thence to the Gulf, and which greatly alters the character of the stream. This basin of broad bottom-lands has an average width of 50 or 60 m., and a length of 500 m. The

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great river winds back and forth across it so much as to have a channel length of 1,097 m. The head of the basin is 30 m. above Cairo; and the gateway by which the river enters the basin is a gap of 8 or 10 m. in length, through a spur of the Ozark range of mts. This spur lies across s. Ill., and across the courses of the two great rivers which meet at Cairo, the M. and the Ohio. In a remote geological age, before the great bottom-lands had been made by the deposit of alluvium, an arm of the sea reached from the present Gulf of Mexico to the head of the present alluvial basin, and at that time the waters of immensely greater streams than the M. and the Ohio, poured over the Ozark barrier in cataracts vastly greater than anything now known. The channel by which the M. now flows through the Ozark Mts. has a rocky descending bed, cut by the stream, and forming the last of the rapids in the M. There are alluvial bottom-lands above the Ozark limit of the great basin of the lower M. They extend as far as 40 or 50 m. above the mouth of the Missouri river, with a width of 6 to 40 m. The Amer. bottom, on the Ill. side, extends down from the mouth of the Missouri for nearly 100 m., with an average breadth of 6 m. Below the mouth of the Ohio, the bottom-lands are low and liable to very wide overflow in flood seasons. The channel of the river is cut through them by the stream itself, in a very winding and changing course. On the w. of the channel, the bottoms, with a single exception at Helena, Ark., are continuous for 500 m., and 50 or 60 m. wide, the greater part of the area being still unreclaimed swamp of extremely rich soil. The Arkansas and the Red rivers are very large tributaries on that side. On the e. side the bluff formation which bounds the alluvial bottoms is occasionally reached by the river channel, which then has a shore from 100 to 300 ft. above the stream, as at Columbus in Ky., Randolph and Memphis in Tenn., Vicksburg, Grand Gulf, and Natchez in Miss., and Baton Rouge in La. With the few exceptions named, a belt of alluvial bottom extends from Cairo to Memphis, and a little lower down begins the great Yazoo basin or Mississippi bottom, an elliptical area of rich lowlands, 360 m. long, to near Vicksburg, and midway of its length 60 m. wide. The cut of the channel is that of a trough, which grows narrower and deeper as we descend the stream. At St. Philip, 37 m. from its mouth, the width is 2,470 ft.; at Carrollton, 84 m. higher up, and on for 123 m. to Baton Rouge, it is 3,000 ft.; for the next 400 m. up the river the width is 4,080; and thence to Cairo, 450 m., it is 4,470 ft. In the upper stream, beyond the Ozark, the width at various points is: below the mouth of the Missouri 3,800 ft.; at the falls of St. Anthony, 1,200 ft.; at Cass Lake 172 ft.; at Bemidji Lake, its most n.w. headwater, 120 ft. The depth at the falls of St. Anthony is 30 to 40 ft.; at the mouth of the Missouri 80 ft.; at the mouth of the Ohio 87 ft.; from the mouth of the Arkansas to the mouth of the Red river 96 ft.; and below Red river 121 ft. The average depth is augmented by floods, 37 ft.

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at St. Louis; 51 ft. at Cairo; 47 at Columbus; 40 at Memphis; 51 at Natchez; 31 at Baton Rouge; $14\frac{1}{2}$ at Carrollton, near New Orleans; $4\frac{1}{2}$ at St. Philip; and less than $2\frac{1}{2}$ at the head of the Passes into the Gulf. A variation from the average width takes place commonly in the large bends, which may become 1 m. or more wide, and there are long reaches of the river where extreme width gives shallow water, shoals, and bars, and bad navigation. A large number of islands occur in the stream, and these are known by numbers, from 1 to about 100. The lower end of the alluvial plain of the M. is a large delta protruded far into the Gulf of Mexico, through which the river finds several channels or Passes to the Gulf, the principal and most direct, the S. Pass, being 17 m. long. It is here especially, and for some distance up the stream, that bars most seriously obstruct navigation. The extent and peculiarity of the windings of the channel, from Cairo to the head of the delta, constantly bending back and forth, and making long loops where it goes round 25 or 30 m. only to return almost to the same point, could have been made only by a rapid and powerful current, irresistibly digging its way along the lines of lowest level and least resistance. With such a current carrying a vast amount of sediment, the channel may anywhere fill up sufficiently to turn the digging power into one or the other bank, or through the neck formed by a large loop, and at once a new course is swiftly made. When loops are cut off, their inlet and outlet are soon banked across by the sediment thrown down at the edges of the stream, thus leaving the cut-off bend of the old channel in the form of a crescent lake, great numbers of which occur on the w. side of the present channel. At the mouths of streams entering the channel of the lower M., drift materials are often thrown into a compact mass miles in length, across and on either side of the tributary mouth, making a bridge on which soil will gather and trees grow, as in the nearly contiguous examples at the mouth of the Red river and the passage from the M. to the Atchafalaya. The last was removed in 1835, after it had been growing for 60 years, and had become 10 m. long, 600 ft. wide, 8 ft. deep, and solid enough to have trees growing on it 60 ft. high. The Red river-raft had become 45 m. long, before it was successfully attacked, 1872, and broken through by some years of costly labor. The waters of the M. are pure and clear to the mouth of the Missouri, where they become whitish muddy. The Ohio adds a greenish tint, and the Arkansas and Red rivers that of their red ochreous sediment. Soil, sand, and gravel from the constantly falling banks, are carried along by the current, and thrown down in the bends and eddies of the stream, in many cases forming obstructive bars, while great trees torn from their place on the banks are left in mid-channel, their roots planted on the bottom and their tops pointed directly in the way of steamers ascending the river. Only by continual care are these dangerous snags kept out of the way of navigation. The

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ancient normal working of the river built up its banks on either side above the level of the alluvial plain, and the forest or sod growth gave these banks comparative permanence, such as even the modern levees do not secure, unless made as nearly as possible like the natural. The earliest artificial levee, a m. in length, was made at New Orleans, 1717, by the engineer De la Tour, to protect the infant settlement. 20 m. below and 30 m. above were settled by 1770, and by 1828 the levees were continuous nearly to the mouth of Red river. In 1850-1 congress made grants of land to the states interested, and provided for a ten-years' survey, which resulted, 1861, in the *Report upon the Physics and Hydraulics of the Mississippi River*, by A. A. Humphreys and H. L. Abbot, on the basis of which all subsequent efforts of improvement have been made. This report established the fact that the digging power of the current at flood could be depended on to open an adequate way, if by effective levees the vast volume of water were kept in its proper course. On this principle the perfect completion of all necessary levees is demanded, as protection for bottom-lands in danger from floods; and on the same principle was carried out, by means of Jetties (q.v.), after the plans and under the direction of Capt. James B. Eads (q.v.), a most effective opening of a channel 30 ft. deep and 350 ft. wide, through the S. Pass into the Gulf, where before there existed a bar of sand and silt, with only $8\frac{1}{2}$ ft. in depth of water. The chief shoals in the M. are on six extensive reaches, of which the Plum Point and Lake Providence are the worst. The former lies between Cairo and Memphis, extending 38 m. from Island No. 26 to Randolph, where the river widens in places to 10,000 ft., with a minimum depth of $4\frac{1}{2}$ ft. The Lake Providence reach extends 25 m., from Skipwith's Landing, La., to the foot of Island No. 95. For such reaches of bad navigation a complete remedy is found in narrowing the channel by means of Dikes (q.v.), and by revetments protecting endangered banks from caving. It has been estimated that a continuous low river channel, with a minimum depth of 10 ft. on all shoals and bars, could be secured, from Cairo down to the head of the Passes, by the expenditure of \$34,000,000. The alluvial deposits which were once carried as sediment by the sea-like river of geological times, and now fill the basin 50 or 60 m. wide, between the bluff formations which were the earliest banks of the flood, are 25 to 60 ft. in depth. The entire theory on which the levee system rests is questioned by a few investigators, who consider that levees tend to raise the whole bed of the river rather than to lower it.

MISSISSIPPI SCHEME.

MISSISSIPPI SCHEME: gigantic commercial scheme, projected in France by John Law (q.v.), of Lauriston, 1717; collapsed 1720. Its primary object was to develop the resources of the province of Louisiana and the country bordering on the Mississippi, a tract at that time believed to abound in the precious metals. The company was incorporated 1717, August, under the designation *Company of the West*, and started with a capital of 200,000 shares, of 500 livres each (somewhat less than \$100). The company obtained the exclusive privilege of trading to the Mississippi, farming the taxes, and coining money. The prospectus was so inviting, that shares were eagerly bought; and when, 1719, the company obtained the monopoly of trading to the E. Indies, China, the South Seas, and all the possessions of the French E. India Company, the brilliant vision opened to the public gaze was irresistible. The *Company of the Indies*, as it was then called, created 50,000 additional shares, but a rage for speculation had seized all classes, and there were at least 300,000 applicants for the new shares, which consequently rose to an enormous premium. Law, as director-general, promised an annual dividend of 200 livres (nearly \$40) per share, which, as the shares were paid for in the depreciated *billets d'état*, amounted to an annual return of 120 per cent. The public enthusiasm rose to absolute frenzy, and Law's house, and the street in front of it, were daily crowded with applicants of both sexes and of all ranks, who were content to wait for hours, nay, for days together, to obtain an interview with the modern Plutus. While confidence lasted, a factitious impulse was given to trade in Paris; the value of manufactures was increased fourfold, and the demand far exceeded the supply. The population is said to have been increased by hundreds of thousands, many of whom were glad to take shelter in garrets, kitchens, and stables. But the regent had meanwhile caused the paper circulation of the national bank to be increased as the M. S. stock rose in value, and many wary speculators, foreseeing a crisis, had secretly converted their paper and shares into gold, which they transmitted to England or Belgium for security. The increasing scarcity of gold and silver becoming felt, a general run was made on the bank. The M. S. stock now fell considerably, and despite sundry desperate efforts, which had momentary success, to keep up its credit, it continued to fall steadily and rapidly. 1720, Feb., the National Bank and the Company of the Indies were amalgamated; but though this gave an upward turn to the share-market, it failed to put the public credit on a sound basis. Several useless attempts were made to mend matters; and those suspected of having more than a limited amount (fixed by a law passed at the time) of gold and silver in their possession, or of having removed it from the country, were punished with utmost rigor. The crisis came at last: 1720, July, the bank stopped payment, Law was compelled to flee the country, and a

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share in the M. S. with difficulty brought 24 livres (less than \$4.50). An examination into the state of the accounts of the company was ordered by govt.; much of the paper in circulation was cancelled; and the rest was converted into 'rentes' at an enormous sacrifice.

MISSISSIP'PI SOUND: arm of the Gulf of Mexico, extending across from Mobile Bay to near New Orleans. It is cut off from the n. side of the Gulf by a chain of long islands—Dauphin, Petit Bois, Horn, Ship, Cat, and Isle au Pied. They are sandy and wooded, and Cat is fortified. These islands afford sheltered harbors, and good sailing between their n. shores and the mainland. The gateway of the M. S. into Mobile Bay is by Grant's Pass, and vessels reach New Orleans by way of Lake Pontchartrain. Lake Borgne, toward the w., is entered from the Sound at St. Joseph's Island.

MISSIVE, n. *mī'sīv* [F. *missive*, a letter—from L. *missus*, sent: It. *missiva*, a missive]: a letter sent; a message. In Scotch law, a memorandum (see **MINUTE: LETTERS**): **ADJ.** intended to be sent; prepared for sending out. **LETTER-MISSIVE** (see **COUNCIL**, in **Congl. Church Usage**).

MISSOLONGHI, *mīs-sō-lōng'ghē*, or **MESOLONGHI**, *mē-*: small town of Greece, govt. of Ætolia, on the n. shore of the Gulf of Patras, 24 m. w. of Lepanto. It is memorable chiefly for the two sieges which it underwent during the war of independence. In 1822, it was invested by land and sea by the Turks, who, after a siege of two months, were compelled to withdraw. In 1826 it was again besieged by an overwhelming Ottoman force; and after ten months of resistance and suffering, its garrison, reduced from 5,000 to 3,000 fighting men, cut their way through the ranks of the enemy, carrying with them a great number of the women and children. The Turks then entered the town, which was almost totally destroyed. Here Lord Byron died, 1824. Pop. over 6,000.

MISSOULA, *Mis-sō'la*: city, cap. of Missoula co., Mont.; on the Missoula river and on the Northern Pacific railroad, 145 m. w. of Helena. It is in a lumber, mineral, and agricultural region. The U. S. milit. post, Fort Missoula, is 4 m. s. of the town. M. has good water power, hospital and headquarters of the Rocky Mountain division of the Northern Pac. railroad, etc. Pop. (1900) 4,366.

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MISSOURI, *mīs-sō'ri*: a state; one of the United States of America; 11th in order of admission into the Union; 5th in population in 1880, 5th in 1890, and 5th in 1900; 10th in railroad mileage; 7th in value of manufacturers in both 1890 and 1900; in 1902 3d in production of corn, 2d in hay, 2d in number of mules. Popularly known as the 'Pennsylvania of the west'; named from the Missouri river.

Location and Area.—M. is in lat. 36° — $40^{\circ} 30'$ n., long. $89^{\circ} 2'$ — $95^{\circ} 42'$ w.; bounded n. by Ia., e. by Ill., Ky., and Tenn., s. by Ark., w. by Ind. Terr., Kan., and Neb.; extreme length n. and s. 277 m., extreme breadth 312 m., mean breadth 208–244 m.; 69,415 sq. m. (44,425,600 acres); Mississippi-river frontage about 500 m.; cap. Jefferson City.

Topography.—In general, the n. portion is level, and the s. undulating and rising gradually to the Ozark mountains. Along the Mississippi river, from Cape Girardeau to the mouth of the St. François river, lies the Great Swamp, with more than 100 m. in M., the most extensive of the numerous swamps in this region, and a marked feature of the M. bottom-lands. The bottom also contains many small islands, lakes, and lagoons, some of the former being above inundation-mark. Where there is any considerable amount of soil in this region, it is very fertile. In the basin of the Osage river the surface becomes rolling prairie, and above it bears noticeable forest growths; while the valley of the Missouri river has a rich alluvial soil, and abounds in forest trees of large size. Broad valleys stretch between the Mississippi and Missouri rivers; woodlands occur chiefly on the margins of water-courses; and the treeless, upland prairies comprise about nine-tenths of the entire state. The drainage of M. is chiefly by the Mississippi river, which forms its entire e. boundary, and is navigable the year round, excepting when obstructed by ice; the Missouri, which nearly bisects the state, flowing from the n.w. corner to the Mississippi, to a point just below Alton, Ill., and navigable like the Mississippi; the Osage, which flows into the Missouri on the s., and is navigable for small steam-boats half the year; and the St. François, White, Black, Gasconade, Grand, Chariton (all navigable for small boats in the open season), Salt, South Grand, Platte, Nodaway, Sac, Meramec, Cuivre, Castor, and Niangua (non-navigable streams). The Missouri river forms the w. boundary of M. for nearly 200 m., and is a rapid, turbid stream, more than half a m. wide at its mouth, and through the greater part of its course wider still; and though draining an enormous stretch of country and receiving many large tributaries, it is exceedingly shallow at certain seasons. The Des Moines river forms a part of the n.e. boundary of the state.

Climate.—M. is subject to great extremes of heat and cold, the thermometer ranging from 100° above zero to

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8° below; but these extremes are infrequent and of short duration, and the climate is healthful, with a generally dry, pure, salubrious air. The summers and winters of M. closely resemble those of Miss. The temperature at St. Louis ranges in winter from 30° to 43°, and in summer from 75° to 80°, with average rainfall 42 inches; annual mean temperature at Jefferson Barracks 55.46°, rainfall 37.83 inches. The river-bottoms and swamps in the s.e. are malarious, and the Missouri river for several weeks in winter is generally frozen so hard as to be safely crossed by loaded wagons.

Geology.—The main formations are quaternary, with alluvium, bluff, and drift; carboniferous or coal measures; Devonian rocks, Hamilton and Onondaga groups; upper Silurian, in four groups, and lower, in three; magnesian limestone, three groups; and eozoic or archaic rocks. The mineral riches of M. are greater than those of any other state. Some gold is found in the drift-sands of the n. portion, and some silver in combination with lead in the galena ores. The coal measures predominate, and are followed by iron (bog in the s.e.; brown hematite in the s.; red hematite in the coal measures; spathic ores in the coal measures and in Phelps co.; specular oxide in the Iron Mountain, Shepherd Mountain, Simon Mountain, and the Pilot Knob districts; sulphurets in the coal measures; and sulphates there and in abandoned coal mines); lead, chiefly in the s.e. and the s.w. portions; nickel and cobalt, in Madison co. and the St. Joseph mines; and millerite, near St. Louis. Besides these, large quantities of wolfram, carbonate of lime, pearl-spar, fluor-spar, felspar, sulphate of baryta, gypsum, mica, asbestos (in Madison co.), mineral tar, potter's clay, fire-clay, kaolin, sand-glass, hydraulic lime and cement, saltpetre, grindstones, white and colored marbles, slates, millstones, granite, and a variety of building-stones, are found. The principal mineral springs are sulphurous, saline, and chalybeate.

Zoölogy.—The mountains abound in bears, panthers, wild cats, wolves, raccoons, opossums, and foxes; game animals are deer, rabbits, squirrels, hares, wild turkeys, quails, pigeons, prairie hens; eagles, vultures, owls, and hawks are frequently seen; wild geese, ducks, brant, teal, herons, and swans are plentiful in season in the principal rivers and swamps; and snakes, lizards, toads, frogs, and turtles frequent the bottoms and swamp-lands. There is also a large variety of song and plumage birds.

Agriculture.—In 1880 the farm-lands covered 27,879,276 acres (of which 16,745,031 were improved); comprised 215,575 farms, valued with fences and buildings at \$375,633,307; contained implements and machinery valued at \$18,103,074; used live-stock valued at \$95,785,282; cost for repairs and new buildings \$4,614,416, and fertilizers \$109,724; and yielded products valued at \$95,912,660. The principal products were: Indian corn 202,414,413 bushels; oats 20,670,958; rye 535,426; wheat 24,966,627; cotton 20,318 bales; wool 7,313,924 lbs.; barley 123,031

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bushels; buckwheat 57,640; Irish potatoes 4,189,694; sweet potatoes 431,484; hay 1,077,458 tons; tobacco 12,015,657 lbs.; butter 28,572,124; and cheese 283,484. The live-stock comprised 667,776 horses; 192,027 mules and asses; 9,020 working oxen; 661,405 milch cows; 1,410,507 other cattle; 1,411,298 sheep; and 4,553,123 swine. In 1890 the number of farms was 238,043, with a total acreage of 30,780,290 acres, or an average of 129 acres per farm. Of this 19,792,313 acres were improved and 10,987,977 acres unimproved. The value of land, fences, and buildings was \$625,858,361; implements and machinery \$21,830,719; live stock on hand, June 1, \$138,701,173; farm products of the year \$109,751,024. Among these products were: Indian corn 196,999,016 bu., oats 39,820,149 bu., wheat 30,113,821 bu., cotton 15,856 bales, sorghum molasses 2,721,240 gals., hay 3,567,635 tons, tobacco 9,424,823 lbs., Irish potatoes 8,188,921 bu., wool 4,040,084 lbs., milk 193,931,103 gals., butter 43,108,521 lbs., cheese 288,620 lbs. In 1895 M. had 6,613,118 acres in corn, producing 238,072,248 bu., valued at \$47,614,450; wheat 1,541,664 acres, 18,499,968 bu., value \$9,434,984. In 1900 the farms numbered 284,886, comprised 33,997,813 acres, and were valued, with improvements, machinery and stock, at \$1,033,121,897.

Manufactures.—M. had (1890) 14,052 manufacturing establishments, with \$189,553,546 capital, employing 143,139 hands, paying \$76,417,364 in wages, requiring \$177,522,382 in raw materials and yielding \$324,561,993 in products. The leading industries were flouring and grist mill products, establishments 710, employees 3,855, wages \$1,811,395, materials \$29,210,639, products \$34,486,795; slaughtering and meat packing (retail), establishments 83, employees 1,486, wages \$896,042, materials \$15,190,663, products \$18,410,851; malt liquors, establishments 30, employees 3,117, wages \$2,441,615, materials \$6,563,536, products \$16,954,137; tobacco, chewing, smoking, and snuff, establishments 26, employees 3,384, wages \$1,518,683, materials \$8,030,780, products \$15,428,764; printing and publishing, establishments 778, employees 8,766, wages \$5,361,268, materials \$3,503,733, products \$13,004,440; foundry and machine-shop products, establishments 186, employees 7,339, wages \$4,538,346, materials \$5,819,009, products \$13,680,773; clothing, men's, establishments 541, employees 9,918, wages \$4,151,831, materials \$6,517,155, products \$13,069,951; lumber and planing mill products, establishments 826, employees 8,298, wages \$3,151,471, materials \$7,456,429, products \$13,289,179; cars, railroad and street, establishments 22, employees 2,641, wages \$1,703,197, materials \$3,215,040, products \$5,319,840; boots and shoes, factory product, establishments 29, employees 2,813, wages \$1,247,292, materials \$2,521,027, products \$4,841,004; furniture, establishments 194, employees 2,501, wages \$1,464,386, materials \$2,104,214, products \$4,508,565; paints, establishments 21, employees 560, wages \$381,348, materials \$2,255,767, products \$3,496,628; patent medicines and compounds, establishments 66, employees 672, wages \$444,118, materials \$761,127, products \$2,518,816; tobacco,

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cigars and cigarettes, establishments 404, employees 1,726, wages \$859,493, materials \$778,492, products \$2,154,882; brick and tile, establishments 232, employees 4,834, wages \$1,706,492, materials \$709,626, products \$3,503,906; chemicals, establishments 19, employees 578, wages \$356,239, materials \$1,600,083, products \$2,736,960; coffee and spice roasting and grinding, establishments 15, employees 344, wages \$219,113, materials \$3,290,476, products \$3,892,792; confectionery, establishments 75, employees 1,656, wages \$695,109, materials \$2,120,762, products \$3,584,953; iron and steel, establishments 6, employees 899, wages \$452,766, materials \$1,461,853, products \$2,241,108; iron work, establishments 44, employees 1,350, wages \$846,441, materials \$1,110,996, products \$2,646,336; roofing and roofing materials, establishments 120, employees 861, wages \$549,720, materials \$955,150, products \$1,981,764; linseed materials \$1,370,267, products \$1,795,401. In 1900 there were 18,754 manufactories, with \$249,888,581 capital, and products valued at \$385,492,784.

Commerce.—The exports of M. (1896) were: Kansas City \$457,567; St. Louis \$3,013,864; St. Joseph \$172,523; total \$3,643,954. The customs receipts were (1896) \$6,959,915.32. The prod. of spirits was (1896) 962,621 gals., (1895) 1,429,491, malt liquors, (1896) 2,262,048 bbl., (1895) 2,139,224 bbl. In 1896 M. had 197 vessels licensed and enrolled, 115,611.50 tonnage; of these 108, with 80,824.64 tonnage, were steam vessels; and 89, with 80,924.64 tonnage, barges. During the year 4 steam vessels, with 1,094.70 tonnage and 1 barge of 28.97 tonnage were built in the state. M. has a large domestic commerce, shipping enormous quantities of cereals, pork, beef, live-stock, manufactures, and merchandise, by rail and river, from St. Louis; and grain, live-stock, wool, hides and pelts, ores, pig-lead, bullion, and packed meat from Kansas City, the latter being the great cattle market of the s. w. since 1868. The imports of merchandise for 1902 at the custom houses at Kansas City, St. Louis, and St. Joseph agg. in value \$5,416,523.

Mining.—The coal prod. of M. (bitumin.) was (1892) 3,017,285 tons, (1893) 3,190,442 t., (1894) 2,383,322 t., (1901) 3,394,721. The prod. of pig iron was 57,020 tons in 1892, 27,518 tons in 1895, and 12,548 tons in 1896; shipments of iron ore (1894) 14,147 tons, (1895) 49,454 tons, (1896) 26,102 tons; lead ore production (1889) 88,964,146 lbs., zinc ore 186,262,308 lbs. The coal measures cover 22,995 sq. m., mainly in the n., n.w., and w. parts of the state; include the 4 subdivisions of the upper carboniferous formation and 6 successive deposits of the lower carboniferous, some of the latter rich in fossils; and comprise 12,420 sq. m. of exposed lower measures, 8,406 sq. m. of upper or barren measures, and 2,000 sq. m. of exposed middle measures. Coal may be mined within 200 ft. of the surface, in an area of about 7,000 sq. m. The upper measures aggregate 1,317 ft. in thickness; the middle 324 ft.; the lower 250–300 ft. Iron in some

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form is found in nearly every co.; but the most important fields are those known as the Iron Mountain and the S.E., S.W., and W. districts. The Iron Mountain district, in Iron and St. François cos., about 80 m. s. of St. Louis, has 2 noted deposits of specular oxide, Iron Mountain proper and Pilot Knob. The former has yielded more than 3,000,000 tons of ore since 1845, the latter more than 1,000,000 tons since 1847, and both give evidence of containing many times their total output. Shepherd Mountain, Simmon Mountain, and the Meramec mines also contain very large deposits. The lead mines of M. rank next in value, and for several years have yielded more than half the entire product of the United States. The richest mines are the La Motte, which is known to have been operated 150 years ago and to have yielded as much as 1,000,000 lbs. per annum for many years, and the Vallé and Perry mines, which have been nearly as productive. The production of copper, formerly very large and steady, has been falling off for several years, because the cheapness of the metal and the great output of the Lake Superior region have discouraged extensive operations. Five companies were engaged in mining zinc 1884, supplied 34 furnaces, and produced 12,500 tons.

Quarries.—In 1890 M. had 150 stone quarries, yielding products valued at \$2,516,159, requiring 4,029 employees, paying \$1,599,872 in wages and using \$2,957,497 capital. Of granite the production was 1,264,317 cu. ft., value \$500,642; limestone, 123 quarries, value of product \$1,859,960, for building stone 11,083,370 cu. ft.; for lime 1,144,962 bbl.; sandstone, 17 quarries, production 734,370 cu. ft., value \$155,557, number employed 192, wages \$69,549, capital \$298,380. Among the marble deposits is a notable cave, the entrance to which is on the summit of Roark Mountain, in Stone co., 18 m. s.e. of Galena and 3 m. n. of White river. It contains a beautiful chamber 150 ft. high; a stalagmite 300 ft. in diameter at the base, 130 ft. high; and within the stalagmite, 60 ft. from its base, a chamber 30x40 ft., and a pool of clear, cool water 15 ft. in diameter. The top of the main chamber is dome-shaped, and about two-thirds the way up is an attractive tracery of fringe extending entirely around it. The cave has numerous striking features, to which fanciful names have been given.

Railroads.—The first railroad was opened 1852, with 38 m. of track. The development since has been: (1855) 139 m.; (1860) 817; (1865) 925; (1870) 2,000; (1875) 2,905; (1880) 4,007—2,000 m. of steel track—gross earnings \$21,000,000; (1884) 5,360; (1890) 6,142; (1893) 6,464; (1894) 6,517; (1895) 6,567; (1896) 6,575. In 1895 the total capital stock was \$275,201,018, funded debt \$301,568,556, total investment \$597,635,002; gross earnings, passengers \$10,442,626, freight \$37,568,014, all sources \$53,776,618; net earnings \$14,434,465, interest paid on bonds \$14,250,593, dividends \$869,478. The principal trunk lines are the Wabash St. Louis and Pacific, Chicago Rock Island and Pacific, Missouri Kansas and Texas, Missouri Pacific, and the St. Louis

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Iron Mountain and Southern. Several iron railroad bridges span the Mississippi and Missouri rivers, 34 different railroad lines enter St. Louis alone, and there is a notable wire suspension-bridge across the Mississippi river at that city.

Religion.—In 1890 M. had 8,064 church organizations, 6,121 church buildings, seating 1,859,589, valued at \$19,663,737; there were 735,839 church members or 27.47 per cent of the entire population. The leading churches were: Regular Bapt. (South), 1,636 organizations, 1,265 churches, value \$2,386,898, and 121,985 members; Bapt. (colored), 234 organizations, 212 churches, value \$400,518, and 18,613 members; Free-will Bapt., 108 organizations, 56 churches, value \$59,825, and 4,752 members; Prim. Bapt., 161 organizations, 116 churches, value \$93,025, and 4,431 members; Cong., 80 organizations, 69 churches, value \$550,344, and 7,617 members; Disciples of Christ, 1,120 organizations, 830 churches, value \$1,632,531, and 97,773 members; German Evang., 124 organizations, 115 churches, value \$70,000, and 25,676 members; Lutherans, 160 organizations, 148 churches, value \$890,090, and 27,099 members; Meth. Epis., 905 organizations, 38 churches, value \$1,835,840, and 58,285 members; Meth. Epis. (South), 1,230 organizations, 163 churches, value \$2,046,389, and 86,466 members; Prot. Meth., 90 organizations, 38 churches, value \$29,900, and 3,359 members; African Meth., 128 organizations, 126 churches, value \$309,429, and 12,579 members; Presb. (North), 207 organizations, 193 churches, value \$1,328,700, and 17,272 members; Presb. (South), 143 organizations, 116 churches, value \$753,490, and 10,363 members; Cumberland Presb., 403 organizations, 280 churches, value \$589,262, and 24,461 members; Prot. Epis., 113 organizations, 84 churches, value \$977,600, and 8,953 members; United Brethren, 105 organizations, 45 churches, value \$47,825, and 4,361 members; Rom. Catholics, 442 organizations, 402 churches, value \$4,070,370, and 162,864 members; Christian Union, 56 organizations, 31 churches, value \$39,050, and 3,926 members; Jewish, 17 organizations, 8 churches, value \$241,800, and 4,450 members; Latter Day Saints, 42 organizations, 18 churches, value \$58,650 and 3,189 members.

Education.—In 1895 M. had an estimated school population (5–18 years) of 917,100; school enrolment, 644,577, or 70.29 per cent. of the school population; average daily attendance, 426,610, or 66.17 per cent. of enrolment; average number of days taught, 140; teachers, 14,487 (male, 5,814; female, 8,673); schoolhouses, number 10,000, value \$15,993,445; income, permanent funds \$838,339, taxation \$5,420,672, other \$66,364, total \$6,325,375; expenditures, for sites, buildings, and furnishings, \$598,825, salaries \$4,063,616; other \$1,020,504, total \$5,682,945, or \$13.32 per pupil. Of high schools M. had 158, with 499 teachers (262 male and 237 female), secondary pupils 13,301 (male 5,113, female 8,188), pupils below secondary grade 59,864 (28,666 males, 31,198 females). For the training of teachers there were the M. state normal schools at Kirksville (1st dist.), 490 students, Warrensburg

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(2d dist.), 649 students, and Cape Girardeau (3d dist.), 279 students; a normal dept. in Lincoln Institute, at Jefferson City, with 36 students; and the St. Louis Normal School, with 150 students. These schools combined had 28 male and 26 female instructors, 5,300 vols. in the libraries, scientific apparatus valued at \$5,150, grounds and buildings valued at \$575,000, and public income \$55,893. The institutions for the superior instruction of women (13) were: Christian Female College (Christian), Columbia; Stephens Female College (non-sect.), Columbia; Howard Female College (Meth. Episc.), Fayette; Fulton Synodical Female College (Presb.), Fulton; Kansas City Ladies' College (Presb.), Independence; Woodland College (Christian), Independence; St. Louis Seminary (non-sect.), Jennings; Bapt. Female College, Lexington; Central Female College (non-sect.), Lexington; The Elizabeth Aull Female Seminary (Presb.), Lexington; Hardin College (Bapt.), Mexico; Lindenwood Female College (Presb.), St. Charles; Mary Institute, Washington Univ. (non-sect.), St. Louis; and Ursuline Acad. (Rom. Cath.), St. Louis. These combined had 43 male and 122 female instructors, 1,467 students, 9,250 vols. in the libraries, scientific apparatus valued at \$4,500, and grounds and buildings valued at \$520,000.

The colleges of liberal arts (19) were: Southwest Bapt. College, Bolivar, chartered 1879 (Bapt.), Julius M. Leavitt, PH.D., pres.; Pike County College, Bowling Green, 1887 (non-sect.), Ernest W. Dow, pres.; Christian Univ., Canton, 1852 (Christian), Thomas F. Campbell, pres.; St. Vincent's College, Cape Girardeau, 1843 (Rom. Cath.), Rev. P. V. Byrne, pres.; Univ. of the State of M. (see below); Grand River College, Edinburg, 1876 (Bapt.), the Rev. J. T. Williams, D.D., pres.; Central College, Fayette, 1855 (Meth. Episc., South), O. H. P. Corprew, chairman faculty; Westminster College, Fulton, 1853 (Presb.), the Rev. William H. Marquess, pres.; Lewis College, Glasgow, 1867 (Meth. Episc.), the Rev. M. L. Curl, D.D., pres.; Pritchett School Institute, Glasgow, 1868 (non-sect.), J. S. Kendall, pres.; La Grange College, La Grange, 1859 (Bapt.), J. F. Cook, LL.D., pres.; William Jewell College, Liberty, 1849 (Bapt.), James G. Clark, LL.D., chairman faculty; Morrisville College, Morrisville, 1872 (Meth. Episc., South), the Rev. J. B. Ellis, pres.; College of the Christian Brothers, St. Louis, 1855 (Rom. Cath.), the Rev. Bro. Paulian, pres.; St. Louis Univ., St. Louis, 1832 (Rom. Cath.), the Rev. Henry Moeller, pres.; Washington Univ., St. Louis, 1853 (non-sect.), M. S. Snow, act'g chancellor; Drury College, Springfield, 1873 (Congl.), Francis T. Ingalls, pres.; Tarkio College, Tarkio, 1885 (Unit. Presb.), the Rev. J. A. Thompson, pres.; Central Wesleyan College, Warrenton, 1864 (Meth. Episc.), the Rev. Herman A. Koch, D.D., president; Central Christian College, Albany, 1892 (Christian); Northwest Missouri College, 1891 (Meth. Episc. South); Lawson Presbyterian College, Lawson, 1891 (Pres.); Scarritt Collegiate Institute, Neosho, 1889 (Meth. Episc. South). The University of the State of M. at Columbia opened in 1841. In 1895 it had

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59 instructors (54 male and 5 female); of these 41 were in the college department and 18 in the professional department; of students the total was 614 (498 males and 116 females), in the collegiate department 318 (256 male and 62 female) graduate department 25 (20 male, 5 female), professional 135 (male). It has 6 fellowships; value of scientific apparatus \$100,800, grounds and buildings \$1,000,000, productive funds \$1,200,000; income, from productive funds \$76,855, state appropriations \$18,495; U. S. appropriations \$13,916, tuition fees \$13,034, other sources \$6,400, total \$148,700, volumes in library 15,000 books, 100,000 pamphlets. Washington Univ., at St. Louis, chartered 1853, provides the whole range of univ. studies excepting theol., and includes the college of arts, polytechnic school (with courses in civil engineering, dynamic engineering, chemistry, and mining and metallurgy), Henry Shaw School of Botany (established 1885), the St. Louis School of Fine Arts, and a law school opened 1866. The univ. had scientific apparatus valued at \$160,000, grounds and buildings valued at \$625,000, productive funds \$650,000, and income, excepting board and lodging, \$85,000.

In 1895 M. had among its charitable schools the following: School for the Deaf and Dumb, Fulton, instructors 24 (12 male, 12 female), pupils 310 (182 male, 128 female), value of grounds and buildings \$301,000, scientific apparatus \$1,000, expenditures \$58,225, volumes in library 2,000; Maria Consila School for the Deaf (private), St. Louis, 7 instructors, 44 pupils (8 males, 36 females); Missouri School for the Blind, St. Louis, 13 instructors, 116 pupils, value of grounds and buildings \$200,000, apparatus, \$350, expenditures \$28,000, volumes in library 4,000. The reform schools were: Missouri State Reform School for Boys, Booneville, 185 inmates, value of grounds and buildings \$75,000, expenditures \$32,300; State Industrial Home for Girls, Chillicothe, 72 inmates, value of grounds and buildings \$50,000, expenditures \$11,691; House of Refuge, St. Louis, 290 inmates (205 male, 85 female), value of grounds and buildings \$200,000, expenditures \$40,000.

Illiteracy.—Persons 10 years of age and over enumerated (1890) 1,995,638, of whom 181,368, or 9.09 per cent., were illiterates; male population 10 years of age and over 1,037,994, illiterates 86,530, or 8.3 per cent.; female population 10 years of age and upwards 957,644, illiterates 94,838, or 9.9 per cent.; total white population 10 years of age and over 1,881,478, illiterates 133,806, or 7.1 per cent.; native white population 10 years of age and over 1,651,622, illiterates 112,938, or 6.8 per cent.; foreign white population 10 years of age and over 229,856, illiterates 20,868, or 9.1 per cent.; colored population 10 years of age and over 114,160, illiterates 47,562, or 41.7 per cent.

Finances and Banking.—In 1890 the assessed value of all taxable property was \$887,975,928; true value \$2,397,902,945, of which \$1,438,731,201 was real estate. The *ad valorem* taxation was \$16,447,206, or \$6.14 per capita and

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\$1.85 per \$100 of assessed valuation. The total debt less sinking fund was \$51,557,568, or \$19.24 per capita; of this \$11,759,832 was state, \$10,240,082 county, \$28,092,103 municipal, and \$1,465,551 school district; annual interest \$2,488,276, or 5.2 per cent. On Jan. 1, 1897, the state bonded debt was \$5,000,000, all at $3\frac{1}{4}$ per cent., school and seminary funds \$4,369,839. In 1902 the assessed val. was \$1,046,469,144, tax rate \$2.50 per \$1,000. On Oct 31, 1902, M. had in operation 78 national banks, capital \$21,609,980, U. S. bonds on deposit \$16,696,040, circulation outstanding \$19,040,508.

History.—The early history of M. is identical with that of La. (q.v.), of which territory it formed a part till 1812, when, La. being admitted as a state, the remainder of the tract was erected into the Terr. of M. Prior to this event, portions of the present state had become important and well known. Some of its lead mines were worked as early as 1720; and between that date and 1760, St. Louis, Cape Girardeau, and St. Genevieve were settled, the first as a fur-trading station. In 1775 St. Louis had pop. of about 800, and 1780 was attacked by a body of English soldiers and Indian allies from Michilimackinac, and was saved only by the timely arrival of Gen. Clarke, who hastened from Ill. at the call for aid. After the separation of La., M. gained rapidly in population by immigration from the e., the accessions more than doubling 1810–17, and St. Louis showing a pop. of 5,000. In 1817 the first steps were taken to secure admission into the Union. The petition of the terr. legislature to congress, for permission to prepare a state constitution, led to a bitter struggle in congress and to a general political excitement. The question at issue was whether M. should be admitted as a slave or a free state. A bill was introduced into congress in the session 1818–9 providing that the terr. should be admitted as a free state. This bill was strenuously opposed by the southern members, who were anxious that slavery should be legalized in the new state. The first constitution prepared forbade the legislature to pass emancipation laws without consent of owners, or to prevent immigrants from bringing slaves into the state with them, and directed it to prevent free negroes and mulattoes from coming to and settling in the state under any pretext. Chiefly through the influence of Henry Clay (q.v.), a compromise was effected, by which M. was to be admitted as a slave state, on condition that from all the terr. w. of M., and n. of the parallel of $36^{\circ} 30'$ (the s. boundary of the new state), slavery should be excluded forever. This compromise allayed the excitement somewhat, but the 'free negro' clause in the proposed constitution revived it. The bill for admission passed the senate, but in the house a proviso was added that the state should abolish slavery, to which the senate disagreed. 1821, Mar. 2, another compromise was adopted, by which M. was to be admitted on the condition that the legislature should pledge the faith of the

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state that the 'free negro' clause should never be executed. June 26 following, the legislature passed a public and 'irrevocable' act in the terms required, though it declared in a preamble that the act was merely one of policy, to secure speedy admission, that the requirement of congress was unconstitutional, and that the people of the state did not intend to respect the condition so imposed. The compromise agreement was observed till virtually repealed by the bills which established the territories of Kan. and Neb. 1854; and M. was admitted by presidential proclamation 1821, Aug. 10. Excepting the part taken by some of its citizens in the Kansas (q.v.) troubles 1854-59, the history of the state was that of general prosperity till the beginning of the civil war. 1861, Jan. 16, the state senate adopted a bill providing for a convention to determine the position of the state on the question of secession. This body met in Jefferson City Feb. 28, and in St. Louis Mar. 4. The dominant feeling in the state, the legislature, and the convention, was in favor of the Union; and nothing occurred to indicate opposition to the prosecution of the war till June 12, when, in consequence of a difficulty between the federal troops sent to St. Louis, as an important military point, and the state militia, Gov. Jackson called out 50,000 state militia to 'repel invasion,' and removed with other state officers from Jefferson City to Boonville. Two days later, the federal troops, under Gen. Nathaniel Lyon (q.v.), attacked the state militia at Jefferson City and defeated them. On July 30 the convention declared the legislature dissolved, and chose a new gov. (Gamble), lieut.gov., and sec. of state. Gov. Jackson immediately issued another proclamation, in which he declared M. to be out of the Union. More federal and some Confederate troops were at once thrown into M.; Gen. Lyon was killed in the battle of Wilson's Creek, near Springfield, Aug. 10; Gen. Fremont declared martial law Aug. 21; and a large Confederate force, under Gen. Sterling Price, captured Lexington Sep. 20. Fremont advanced into the s.w., having several skirmishes on the way, and was succeeded by Gen. Hunter Nov. 2, and he by Gen. Halleck, as commander of the w. dept., Nov. 18. About this time nearly half the state was held by the Confederates, and an attempt was made, by some members of the old legislature, to force the state into the Confederacy. In 1862, Feb., the Confederates under Gen. Price were driven into Ark. by federal troops under Gen. Curtis; and during 1862 and 3 the state was disturbed by guerilla warfare, mainly on the s. border. The convention of 1861, kept alive by adjournments, passed an ordinance 1863 providing for the emancipation of all slaves in the state in 1870. Late in 1864, Gen. Price again invaded M. and made a raid diagonally from s.e. to n.w., but was ultimately forced to retreat into w. Ark. In 1864, Nov., a state election was held, the state having been governed since 1861, July, by officers elected by the convention. 1865, Jan. 6, a convention assembled in St. Louis and framed a new constitution, which was adopted

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by the people June following; 1869 the last of the amendments (15th) to the federal constitution was ratified by the legislature; and 1875, Oct. 30, the present state constitution was adopted. During the civil war, M. furnished 109,111 men to the federal armies.

Government.—The executive authority is vested by the constitution (1875) in a gov. elected for 4 years, salary \$5,000 per annum; the legislative in a general assembly, comprising (1890) a senate of 34 members elected for 4 years, and a house of representatives of 140 members elected for two years, salary of each \$5 per day and mileage, sessions biennial, limit of sessions 70 days; and the judicial in a supreme court, comprising 5 judges elected by the people for 10 years, one being elected every 2 years, and the oldest in commission being chief-justice, salary of chief-justice \$4,500 per annum; in a circuit court in each judicial circuit, as created by the legislature, with one judge in each; in co. and probate courts, with one judge for each; municipal corporation courts; special circuit, criminal, and criminal correction courts in the city of St. Louis (which is a distinct political subdivision of the state); and the usual justices of the peace. The lieut. gov. receives \$7 per day during the session of the general assembly; sec. of state \$3,000 per annum; treas. \$3,000; auditor \$3,000; atty. gen. \$3,000; adjt. gen. \$2,000; supt. public schools \$3,000; register of lands \$3,000; 3 railroad commissioners \$3,000; supt. insurance dept. \$4,000; 2 U. S. district judges \$3,500 each; 5 collectors of internal revenue \$2,250—\$4,500 each; and U. S. surveyor of customs (St. Louis) \$5,000. The legal rate of interest is 6 per cent.; by contract 10; usury forfeits entire interest. Adultery, wilful desertion for 1 year, habitual drunkenness, cruel and abusive treatment, imprisonment for or conviction of felony, and ungovernable temper, are among the chief grounds of divorce.

The successive govts., with their terms of service, are as follows: Alexander McNair 1820–24; Frederick Bates 1824–26; John Miller 1826–32; Daniel Dunklin 1832–36; Lilburn N. Boggs 1836–40; Thomas Reynolds 1840–44; John C. Edwards 1844–48; Austin A. King 1848–53; Sterling Price 1853–57; Trusten Polk 1857; H. Johnson (act'g) 1857; R. M. Stewart 1857–61; Claiborne F. Jackson 1861; Hamilton R. Gamble 1861–64; Thomas C. Fletcher 1865–69; Joseph W. McClurg 1869–71; Benjamin Gratz Brown 1871–73; Silas Woodson 1873–75; Charles H. Hardin 1875–77; John S. Phelps 1877–81; Thomas T. Crittenden 1881–85; John S. Marmaduke 1885–87; Allen G. Morehouse 1887–89; David R. Francis 1889–93; William J. Stone 1893–97; L. V. Stephens 1897.

Counties, Cities, and Towns.—M. is divided into 115 counties. In 1880 the most populous *counties* were: St. Louis (city and co. co-extensive) 350,518; Jackson 82,325; Buchanan 49,792; Jasper 32,172; Saline 29,911; Nodaway 29,544; Greene 28,801; Johnson 28,172; Pettis 27,271; Pike 26,715; and Franklin 26,534; *cities and towns*: Kansas City 55,785; St. Joseph 32,431; Hannibal 11,074;

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Joplin 7,038; Springfield 6,522; Moberly 6,070; Jefferson 5,271; and St. Charles 5,014. In 1890 the leading *counties* were: St. Louis 451,770; Jackson 160,510; Buchanan 70,100; Jasper 50,500; Greene 48,613; Saline 33,762; Pettis 31,151; Lafayette 30,184; Pike 26,321; and Chariton 26,254; *cities and towns*: Kansas City 132,716 (including 13,048 in suburbs since declared illegally annexed); St. Joseph 52,324; Springfield 21,850; Hannibal 12,857; Joplin 9,943; Moberly 8,215; Carthage 7,981; and Jefferson 6,742.

Politics.—State, congressional, and presidential elections are held Tuesday after first Monday in Nov. Officers and men in the U. S. army, and inmates of asylums, poor-houses, and prisons, are excluded from voting. The state govt. (1903) was democrat, with a party maj. of 18 in the sen., 22 in the house, 40 on joint ballot. M. has 18 electoral votes. Her votes for pres. and vice-pres. have been as follows: 1824, Henry Clay and Andrew Jackson 3; 1828, Andrew Jackson and John C. Calhoun; 1832, Andrew Jackson and Martin Van Buren 4; 1836, Martin Van Buren and Richard M. Johnson; 1840, Martin Van Buren and Richard M. Johnson; 1844, James K. Polk and George M. Dallas 7; 1848, Lewis Cass and William O. Butler; 1852, Franklin Pierce and William R. King 9; 1856, James Buchanan and John C. Breckinridge; 1860, Stephen A. Douglas and Herschel V. Johnson; 1864, Abraham Lincoln and Andrew Johnson 11; 1868, U. S. Grant and Schuyler Colfax; 1872, Thomas A. Hendricks 6, B. Gratz Brown 8, and David Davis 1, for pres., and B. Gratz Brown 6, George W. Julian 5, J. M. Palmer 3, and William S. Groesbeck 1, for vice-pres.; 1876, Samuel J. Tilden and Thomas A. Hendricks 15; 1880, Winfield S. Hancock and William H. English; 1884, Grover Cleveland and Thomas A. Hendricks 16; 1888, Grover Cleveland and Allen G. Thurman 16; 1892, Grover Cleveland and Adlai E. Stevenson 17; 1896, William J. Bryan and Arthur Sewall 17; 1900, William J. Bryan and Adlai E. Stevenson.

Population.—(1810) white 17,227, free colored 607, slaves 3,011, total 20,845; (1820) white 55,988, free colored 376, slaves 10,222, total 66,586; (1830) white 114,795, free colored 569, slaves 25,091, total 140,455; (1840) white 323,888, free colored 1,574, slaves 58,240, total 383,702; (1850) white 592,004, free colored 2,618, slaves 87,422, total 682,044; (1860) white 1,063,489, free colored 3,572, slaves 114,931, total 1,182,012; (1870) white 1,603,146, colored 118,071, total 1,721,295; (1880) white 2,022,826, colored 145,554, total 2,168,380; (1890) 2,679,184; (1900) 3,106,665.

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MISSOU'RI RIVER: the great head stream which forms, by union with the upper Mississippi river and the Ohio river, the trunk river bearing the name Mississippi (q.v.). The name M. signifies Mud river, and the character of the water known for more than 1,200 m. of the Mississippi, from the Gulf of Mexico, is given by the M. Below the confluence of the two streams, 16 m. above St. Louis, the separate volumes of the upper Mississippi and the M. flow side by side for a long distance without mingling, and it is plain to the eye which is the great river and which will be lost in the other. The lower reach of the M. is of about 400 m. across the state of Mo., in a generally e. direction. From Kansas City n. it is the w. boundary of the state, and beyond the n.w. corner of Mo. the ascent of the stream leads past Omaha to Sioux City, 824 m. from its mouth, and thence n.w. and n. across S. Dak. and more than half of N. Dak. From this point the line of the stream is generally e. and w., past the mouth of the Yellowstone, a great navigable tributary, and far on to the foot-hills of the Rocky Mts., where the Great Falls occur, a succession of four within $16\frac{1}{2}$ m.; the successive perpendicular rises being 87 ft., 19 ft., 47 ft., and 26 ft. The rapids connecting the cataracts increase the whole rise to 357 ft. The ascending course of the stream penetrates the Rocky Mts. 145 m. further on, by a narrow gorge, $5\frac{3}{4}$ m. long, 450 ft. wide, and with walls of rock rising perpendicularly 1,200 ft. directly from the water. The source is 400 m. beyond these 'Gates of the Rocky Mts.,' in the confluence of two small streams, the Jefferson and Wisdom, of which the latter rises within a mile of the head springs of Clarke's fork of the Columbia. The stream thus formed is joined 80 m. down by the Gallatin and Madison, and this confluence of three rivers is by some regarded as the starting-point of the M. The higher point is at the boundary between Mont. and Ida., lat. $45^{\circ} 15' \text{ n.}$, and long. $110^{\circ} 30' \text{ w.}$; and for nearly 2,000 m., descending the river, the course is through Mont., N. Dak., and S. Dak., after which it has Io. and the n. part of Mo. on its left bank, and Neb. and Kan. on its right, until, at Kansas City, it passes into and across Mo., to its mouth, 2,908 m. from the lower source, or 2,988 from the highest, and 1,286 m. from the fall of its muddy waters into the Gulf of Mexico. The width of the M. is 1,500 ft. at Fort Benton, 2,500 ft. at Sioux City, and 3,000 ft. from St. Joseph to its mouth. The highest source is not far from 7,000 ft. above sea-level; that at Fort Benton 2,845 ft.; at Sioux City 1,065 ft.; at St. Joseph 756 ft.; and at its mouth 381 ft. The mouth of the M. is 159 m. above the passage of the trunk river into the head of the Mississippi alluvial basin, and 189 m. above the mouth of the Ohio. Navigation on the M. is regular to the mouth of the Yellowstone, on the border of N. Dak. and Mont., and it may extend as far as the Great Falls. The Yellowstone, a navigable river for about 300 m., is the largest tributary of the M., and

lower down other tributaries on the right are the Little Missouri, Big Cheyenne, White Earth, Niobrara, Platte or Nebraska, Kansas, and Osage. On the left it receives the Milk, Dakota, Big Sioux, and Little Sioux. All the great streams which rise on the e. side of the Rocky Mts., except the Arkansas, thus send their waters into the M., which, with its large share of the streams between it and the upper Mississippi, drains an area of 518,000 sq. m. Some idea of the value of the M. to inland commerce is given in the fact that great numbers of steamers ply on its upper waters even, and on the Yellowstone, where a single tug may conduct a fleet of barges equal to 500 r.r. cars; and a steamer has been known to descend to New Orleans with barges carrying 600,000 bush. of coal, equal to 1,800 car-loads. The upper course of the M. is through a dry and open country, where at certain seasons the rapid evaporation of the water leaves portions of the stream shallow. The elevation of the sources is about 7,500 ft. above sea-level; that of the stream at the mouth of the Yellowstone is 2,010 ft.; and the general flow of the water is rapid. On the lower course of the river its channel is cut through a rich alluvial valley, back of which, on either side, lie extensive prairies. At its mouth the M. is over half a m. wide, and in many places higher up the width is much greater. The chief points of commerce reached in ascending the M. are St. Charles, Jefferson City, Boonville, and Lexington, in crossing the state of Mo.; then Kansas City; St. Joseph, Mo.; Omaha, Neb.; Council Bluffs and Sioux City, Io.; Yankton and Pierre, S. Dak.; Bismarek, N. Dak.; and Fort Benton, Montana.

MISSOURI COMPROMISE: see MISSOURI.

MISSPEAK, v. *mĭs-spĕk'* [*mis*, wrong, and *speak*]: in OE., to blunder in speaking.

MISSPELL, or MISSPEL, v. *mĭs-spĕl'* [*mis*, wrong, and *spell*]: to write with wrong letters; to spell wrongly. MISSPELL'ING, imp.: N. a wrong spelling. MISSPELLED', pp. *-spĕld'*, or MISSPELT', pp. *-spĕlt'*: ADJ. wrongly spelt.

MISSPEND, v. *mĭs-spĕnd'* [*mis*, wrong, and *spend*]: to waste and consume to no purpose; to spend badly. MISSPEND'ING, imp. MISSPENT', pt. *-spĕnt*: ADJ. wasted; consumed to no purpose.

MISSTATE, v. *mĭs-stāt'* [*mis*, wrong, and *state*]: to state wrongly; to represent falsely. MISSTA'ING, imp. MISSTA'TED, pp. MISSTATE'MENT, n. *-mĕnt*, an erroneous representation, whether verbal or written.

MISSY: see Miss 1.

MIST—MISTAKE.

MIST, *n.* *mǐst* [Icel. *mistr*, a foggy darkness in the air: Dut. *miest* and *mist*, mist; *mieselen*, to exhale a mist, to rain fine: Ger. *mist*, dung, mist]: the vapor of water hanging over sea or land, less dense than a fog (q.v.); vapor floating and falling in fine particles in the form of very small rain; that which dims or obscures, or intercepts vision, as if it were a vapor or a mist: *V.* in *OE.*, to cover with vapor; to cloud. **MIST-LIKE**, having the appearance of mist; misty. **MISTY**, *mǐst'ĩ*, *a.* overspread with mist; dim or obscure. **MIST'FUL**, *a.* -fŭl, clouded with mist. **MIST'ILY**, *ad.* -ĩ-lĩ, darkly; obscurely. **MIST'INESS**, *n.* -ĩ-nēs, state of being misty; obscurity.

MISTA'EN, *pp.* *mīs-tān'*: a poetic spelling for **MISTAKEN**.

MISTAKE, *v.* *mīs-tāk'* [*mis*, wrong, and *take*: Icel. *mistaka*, to take by mistake—from *taka*, to take]: to misunderstand; to conceive wrongly; to take one person or thing for another; to err in opinion or judgment: *N.* an error of any kind; a misconception; a blunder; an oversight. **MISTA'KING**, *imp.*: *N.* in *OE.*, an error. **MISTA'KEN**, *pp.* -tāk'n, wrong or in error, as applied to persons (this application to *persons* is a popular usage, but of doubtful propriety): misunderstood, as applied to things: **ADJ.** erroneous; wrongly judging; incorrect. **MISTOOK**, *pt.* *mīs-tūk'*, did mistake. **MISTAKABLE**, *a.* *mīs-tāk'kǎ-bl*, that may be mistaken. **MISTA'KENLY**, *ad.* -lĩ. **MISTA'KINGLY**, *ad.* -lĩ. **BY MISTAKE**, under error or misapprehension; unintentionally. **NO MISTAKE**, *familiarly*, without fail; without possible error; with certainty. **TO BE MISTAKEN**, properly, to be taken wrongly, i.e., to be misunderstood; also popularly, but with doubtful propriety, to misunderstand, to commit an error of judgment; to be deceived.

MISTAKE', in Law: an error which may be due to ignorance, forgetfulness, carelessness, undue confidence in another, etc., which leads to the omission of something which should have been performed, or to the commission of an act which would not otherwise have been done. There are two classes of mistakes; those of law, and those of fact, which are very differently treated. The great principle that ignorance of the law is no excuse for wrong-doing is maintained in courts both of law and of equity. If this were abandoned many people would prefer to remain ignorant of matters concerning which they should be informed. If the *M.* is purely legal the law must take its course, even though the results of an act are radically different from those anticipated. But when there are such causes for the *M.* as incapacity, fraud, undue influence, or imposition, a court of equity may set aside the contract. When there is no fraud, either of act or of intent, but an error is held in common by both parties to a transaction, a compromise will usually be sustained by the court. The same is true of compromises of contested claims to estates. A *M.* in regard to the law of a foreign country is subject

to rectification on the ground that it is not obligatory on a resident of one country to study the laws of another. And a M. in law may be accepted as an excuse when a man has promised to perform a certain act because he supposed that it was obligatory on him to do so when no such claim existed. Mistakes of fact are much more readily corrected than are those of law. When an error shared by both parties is committed in ignorance of some important fact bearing on the case, relief can usually be secured through the courts, even though no fraud or deception has been attempted; but the facts must be of such importance as to exercise a determining influence on the transaction. The M. may be rectified by a return of the property to the former owner, or when that is impossible, by an imposition of money damages for any deficiency which may be found to exist. When the M. is on only one side, and there has been no fraud, legal relief cannot usually be secured. The means of information being open to both parties, each is supposed to look after his own interests. But where a party having apparent reason to do so, reposes confidence in another and is misled by the concealment of some important fact, he may be able to obtain redress from the courts of equity. Legal instruments, agreements, etc., which contain material errors and fail to set forth the intention of the parties may be corrected by order of the court, but this does not apply to a M. of law in which the language of the contract carries a different meaning from what the parties accepting it expected.

MISTASSINI, *mĭs-tās-sē'nē*, LAKE: large lake in the s. part of N. E. Territory, Canada. The Territory extends from the n. side of the province of Quebec up the whole e. side of Hudson's Bay; and the lake is the head-water of Rupert's river, which flows w. into the s. arm of Hudson's Bay, James's Bay. The direction of the lake from Quebec is a little w. of n., and the situation is just beyond and close to, the Wotchish Mts., and directly opposite the head of an e. branch of the Saguenay river. Its dimensions are not accurately known; but it is probably about 100 m. long and 15 to 30 or 40 m. wide, but of irregular outline.

MISTAUGHT, v. *mĭs-tawt'* [*mĭs*, wrong, and *taught*]: pt. and pp. of *misteach*; wrongly taught.

MISTEACH, v. *mĭs-tēch'* [*mĭs*, wrong, and *teach*]: to instruct wrongly. MISTEACH'ING, imp. MISTAUGHT', pt. and pp., which see.

MISTER, n. *mĭs'tēr* [a misspelling of *master*—from L. *magister*, a master]: a common title of address to any adult male, contracted into Mr.

MISTER: for MYSTER, trade; craft: see MYSTER.

MISTERM, v. *mĭs-tērm'* [*mĭs*, wrong, and *term*]: to name erroneously.

MISTHINK—MISTLETOE.

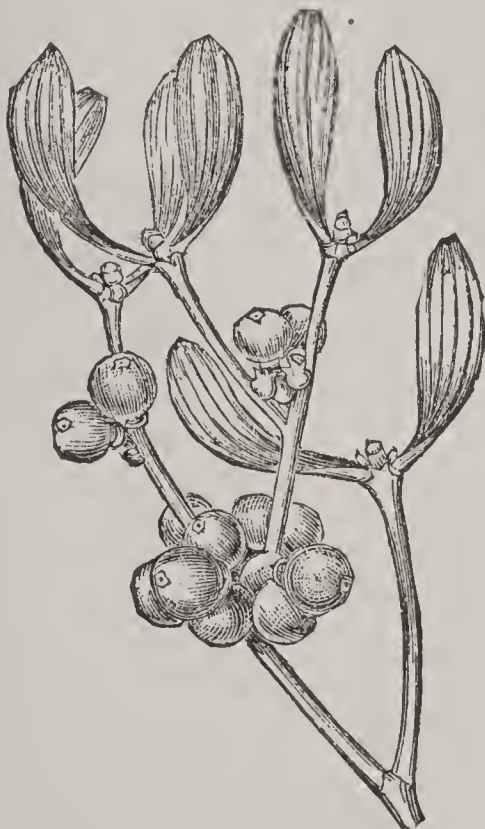
MISTHINK, v. *mĭs-thĭngk'* [*mis*, wrong, and *think*]: in *OE.*, to think ill or wrongly. **MISTHOUGHT'**, n. *-thawt'*, a false opinion; a wrong thought.

MISTILY, **MISTINESS**: see under **MIST**.

MISTIME, v. *mĭs-tĭm'* [*mis*, wrong, and *time*]: to arrange ill as to time; not to adapt to the time. **MISTI'MING**, imp.: N. the doing at a wrong time, or unseasonably. **MISTIMED'**, pp. *-tĭmd'*: **ADJ.** done out of season or at a wrong time.

MISTITLE, v. *mĭs-tĭtl* [*mis*, wrong, and *title*]: to designate by a wrong title or name. **MISTI'TLING**, imp. *-tĭtling*. **MISTI'TLED**, pp. *-tĭtld*.

MISTLETOE, or **MISLETOE**, or **MISSELTOE**, n. *mĭz'l-tō* [*Icel. mistelteinn*; *AS. misteltan*; *Dut. and Ger. mistel*, the mistletoe—the latter part is the *Icel. teinn*, a prong of metal: *Norw. tein*; *Goth. tains*, the shoot of a tree, a twig]: genus (*Viscum*) of small parasitical evergreen shrubs of nat. order *Loranthaceæ*. This order is exogenous, and contains more than 400 known species, mostly tropical and parasites. The leaves are entire, almost nerveless, thick and fleshy, and without stipules. The flowers of many species are showy. The calyx arises



Mistletoe (*Viscum album*).

from a tube or rim, which sometimes assumes the appearance of a calyx, and is so regarded by many botanists; what others deem the colored calyx being viewed by them as a corolla of 4 or 8 petals or segments. Within this are the stamens, as numerous as its divisions, and opposite to them. The ovary is one-celled, with a solitary ovule; the fruit one-seeded, generally succulent.—**COMMON M.**

MISTOOK.

(*V. album*) is a native of Britain and of the greater part of Europe, forming a bush about 4 ft. long, growing on many kinds of trees, particularly on the apple, and others botanically allied to it, as the pear, service, and hawthorn; sometimes, also, on sycamores, limes, poplars, locust-trees, and firs, but very rarely on oaks (contrary to the common belief). It is very plentiful in some parts of s. England, its evergreen leaves giving a peculiar appearance to the orchards in winter, when the bushes of *M.* are very conspicuous among the naked branches of the trees; but it is very local. The stems are *dichotomous* (i.e., divide by forking); the leaves are opposite, of yellowish-green color, obovate-lanceolate, obtuse. The flowers are inconspicuous, and grow in small heads at the ends and in the divisions of the branches, the male and female flowers on separate plants. The berries are about the size of currants, white, translucent, and full of a very viscid juice, which serves to attach the seeds to branches, where they take root when they germinate, the radicle always turning toward the branch, whether on its upper or under side. The *M.* derives its nourishment from the living tissue of the tree on which it grows, and from which it seems to spring as if it were one of its own branches. The berries are a favorite food of thrushes; and it has been supposed that the *M.* was propagated by the seeds deposited from the birds; the propagation is really by the wiping off of the seeds from the bird's beak which it rubs against the bark. Bird-lime is made from the seeds and bark. The *M.* was intimately connected with many superstitions of the ancient Germans and of the British Druids. In the northern mythology, Balder is said to have been slain with a spear of mistletoe. Among the Celts, the *M.* which grew on the oak was in peculiar esteem for magical virtues. Traces of the ancient regard for the *M.* remain in some old English and German customs, as kissing under the *M.* at Christmas. The *M.* was at one time in high repute as a remedy for epilepsy and convulsions, but it seems to possess no decided medicinal properties.—*Loranthus Europæus*, a shrub very similar to the *M.*, but with flowers in racemes, is plentiful in parts of s. Europe, and very frequently grows on oaks.—*L. odoratus*, Nepaulese species, has very fragrant flowers.—*American Mistletoe* (*Phoradendron flavescens*) differs little from the European, and was formerly included in the same genus. It has a globular calyx, 3 (rarely 2-4) lobed; and is found on deciduous trees from N. J. to Ill. and southward. *Note.*—*Mistel*, the 'mistletoe,' is a d.n. of Ger. *mist*, dung—probably in reference to the seeds deposited by the birds who eat the berries, or it may refer to the slime of the berries: O. Dut. *mistel*, bird-lime—see Skeat.

MISTOOK: pt. of **MISTAKE**, which see.

MISTRAL—MISTRESS.

MISTRAL, n. *mĭs'trāl*, or **MISTRAON**, or **MAESTRAL** [F. *mistral*; OF. *maestral*, the mistral—from It. *maestrale*—from mid. L. *magistrālis*—*lit.*, the masterful wind]: Provencal designation of the *Caurus* or *Corus* of the Romans; a n.w. wind which at certain seasons of the year prevails on the s. coast of France. Its approach is heralded by a sudden change of the temperature, from genial warmth to piercing cold; the air is felt to be purer, and more easily inhaled, the azure of the sky is undimmed by cloud, and the stars shine by night with extraordinary and sparkling brightness; this last appearance is an infallible prognostic. The M. then comes in sudden gusts, struggling with the local aërial currents, but its fast increasing violence soon overcomes all opposition. In a few hours, it has dried up the soil, dispersed the vapors of the atmosphere, and raised a dangerous tumult among the waters of the Mediterranean. The M. blows with its greatest force from the end of autumn to the beginning of spring, and causes much damage to the fruit-trees in blossom, and often to the field-crops. It is a terror to the mariners of the gulfs of Lyon and Valence, and even the most hardy seaman makes all haste to a harbor of refuge. The most probable cause of the M. is the derangement of atmospheric equilibrium produced by the cold condensed air of the Alps and Cevennes rushing in to supply the vacuum produced by the expansion of the air in the warm s. provinces of France, and on the surface of the Mediterranean. This wind is appropriately denominated by the Italians *Maestro*.

MISTRANSLATE, v. *mĭs'trāns-lāt'* [*mis*, wrong, and *translate*]: to translate erroneously. **MIS'TRANSLA'TING**, imp. **MIS'TRANSLA'TED**, pp. **MIS'TRANSLA'TION**, n. *-lā'shūn*, an erroneous version or translation.

MISTREADING, n. *mĭs-trēd'ing* [*mis*, wrong, and *tread*]: in *OE.*, a false step; the choosing of a wrong path.

MISTREAT, v. *mĭs-trēt'* [*mis*, wrong, and *treat*]: to ill-treat; to abuse. **MISTREAT'ING**, imp. **MISTREATED**, pp. **MISTREATMENT**, n. *-mĕnt*, ill treatment·abuse.

MISTRESS, n. *mĭs'trēs* [OF. *maïstressē*; F. *maîtresse*, fem. of *maître*, master: L. *magistra*, a mistress]: the fem. of *master*; a woman who instructs or governs a school; a female teacher; a woman who governs or holds authority; a woman beloved and courted; a term of address applied to a married untitled woman, now contracted into and written Mrs; the female head of a family; a concubine; a woman who holds something in possession; a woman who has skill in something. **MISTRESS OF THE WORLD**, a name of Old Rome, in respect of the wide and far-reaching extent of her dominions and power. **MISTRESS OF THE ROBES**, a post in the queen's household, held by a lady of high rank, but its duties may often be performed by deputy—so named from having charge of the queen's robes.

MISTRETTA—MISY.

MISTRETTA, *mĭs-trĕt'ĭtā*: town of the island of Sicily, 67 m. w.s.w. of Messina; cap. of a district. It occupies a healthful situation near the n. coast, in the vicinity of the river Nebroden. Pop. (1881) 13,132.

MISTRUST, n. *mĭs-trŭst'* [*mis*, wrong, and *trust*]: want of confidence or trust; suspicion: V. to doubt; to suspect; to regard with suspicion. **MISTRUST'ING**, imp. **MISTRUST'ED**, pp. **MISTRUST'FUL**, a. *-fŭl*, suspicious; wanting confidence in. **MISTRUST'FULLY**, ad. *-lĭ*.

MISTUNE, v. *mĭs-tŭn'* [*mis*, wrong, and *tune*]: to tune wrongly; to put out of tune. **MISTU'NING**, imp. **MISTUNED'**, pp. *-tŭnd'*.

MISTY, **MISTILY**, **MISTINESS**: see under *Mist*.

MISUNDERSTAND, v. *mĭs'ŭn-dĕr-stănd'* [*mis*, wrong, and *understand*]: to take in a wrong sense; to misconceive. **MIS'UNDERSTAND'ING**, imp.: N. a mistake of the meaning; an error; a softer name for a quarrel; disagreement; dissension or slight difference. **MIS'UNDERSTOOD'**, pt. and pp. *-stŭd'*, did take in a wrong sense; understood wrongly.

MISUSAGE, n. *mĭs-ŭ'zāj* [*mis*, wrong, and *usage*]: ill usage; abuse.

MISUSE, v. *mĭs-ŭz'* [*mis*, wrong, and *use*]: to treat or use improperly; to treat ill; to use to a bad purpose: N. *mĭs-ŭs'*, improper use; ill treatment; wrong application. **MISU'SING**, imp. *-zĭng*. **MISUSED**, pp. *mĭs-ŭzd'*.—**SYN.** of 'misuse, v.': to abuse; misapply; misemploy; maltreat.

MISWEEN, v. *mĭs-wĕn'* [*mis*, wrong, and *ween*]: in *OE.*, to misjudge; to mistrust.

MISWEND, v. *mĭs-wĕnd'* [*mis*, wrong, and *wend*]: in *OE.*, to go wrong.

MISY, n. *mĭ'sĭ* [a miner's name]: an impure sulphate of peroxide of iron, a mineral of a fine bright-yellow color, and of friable structure.

MITÂKSHARÂ: name of several commentatorial works in Sanskrit—e.g., of a commentary on the text-book of the Vedânta philosophy, of a commentary on the Mîmânsâ work of Kumârila, of a commentary on the Br'ihadâran'yaka (see VEDA), etc. The most renowned work, however, bearing this title is a detailed commentary by Vijnânes'wara (called also Vijnânanâtha), on the law-book of Yâjñavalkya (q.v.); and its authority and influence are so great that 'it is received in all the schools of Hindu law from Benares to the s. extremity of the peninsula of India as the chief groundwork of the doctrines which they follow, and as an authority from which they rarely dissent' (cf. two treatises on the Hindu law of inheritance, translated by H. T. Colebrooke, Calcutta 1810). Most of the other renowned law-books of recent date, such as the Smr'iti-Chandrikâ, which prevails in s. India, the Chintâman'i, Vîramitrodaya, and May-ûkha, which are authoritative severally in Mithilâ, Benares, and with the Mahrattas, generally defer to the decisions of the M.; the Dâyaabhâga of Jimûtavâhana alone, which is adopted by the Bengal school, differs on almost every disputed point from the M., and does not acknowledge its authority. The M., following the arrangement of its text-work, the code of Yâjñavalkya, treats in its first part of duties in general; in its second, of private and administrative law; in its third, of purification, penance, devotion, etc.; but since it frequently quotes other legislators, expounding their texts, and contrasting them with those of Yâjñavalkya, it is not merely a commentary, but supplies the place of a regular digest. The text of the M. has been edited several times in India. An excellent translation of its chapter 'On Inheritance,' was published by Colebrooke in the work above referred to; and its explanation of Yâjñavalkya is followed by the same celebrated scholar in his *Digest of Hindu Law*.

MITAU: see **MITTAU**.

MITCHEL, *mîch'él*, JOHN: 1815, Nov. 3—1875, March 20: b. Dungiven, Ireland. He graduated, 1836, from Trinity College, and practiced law several years, meanwhile writing for the press. In 1845 he became editor of the *Dublin Nation* and about this time published the *Life of Hugh O'Neil*. In 1848 he left the *Nation* and established the *United Irishman*, which in about three months was suppressed on account of its violent revolutionary utterances, and M. was sentenced to transportation for 14 years. He was taken to Bermuda, and later to Australia. He escaped, 1853, to New York, where he established a pro-slavery paper and published his *Jail Journal*. He afterward published papers in Knoxville, Tenn., and Richmond, Va.; returned to Ireland 1874, and was elected to parliament, but was not allowed to serve. He was elected again but died at Cork before his case was decided. He edited the poems of Thomas Davis and James C. Mangan, wrote *The Last Conquest of Ireland—Perhaps*, and continued McGeoghegan's *History of Ireland*.

MITCHEL.

MITCHEL, ORMSBY MACKNIGHT, LL.D.: 1810, Aug. 28—1862, Oct. 30; b. Morganfield, Ky.: astronomer and soldier. His childhood was spent in Lebanon, O., where he gained a good knowledge of Greek, Latin, and mathematics. When 13 years of age he became clerk in a store at Miami, but later returned to Lebanon. In 1825, June, he entered West Point Milit. Acad., from which he graduated 1829. Among his classmates were Robert E. Lee and Joseph E. Johnston. For two years he was assistant prof. in the mathematical dept. of the institution and held the rank of 2d licut. of artillery. In 1832 he was stationed at St. Augustine, Fla., but soon resigned. He studied law, was admitted to practice in Cincinnati, and also held the position of chief engineer of a railroad. In 1834 he was chosen prof. of mathematics, philosophy, and astronomy, in Cincinnati College, which position he held till 1844, when he was made director of a large observatory which had been erected in Cincinnati mainly through his efforts, and in behalf of which he had delivered many lectures and made a trip to Europe. In 1859 he became director of the Dudley observatory, Albany, N. Y., for which he had drawn the plans; but he still retained his connection with the Cincinnati institution. He invented and perfected various astronomical instruments of great value, and made a large number of important observations. At the opening of the civil war he entered the army and 1861, Aug. 9, was appointed brig.gen. of Ohio vols. He fortified the city of Cincinnati, served in various southern states, and won fame in the great railroad raid of 1862 in n. Ala. He was, 1862, April 11, appointed maj.gen.; in Sep. of that year was assigned to the dept. of the south, and while actively arranging for the campaign was taken with yellow fever and died at Beaufort, S. C. The observatory which he founded at Cincinnati has been removed to Mount Look-out, has received his name, and is supported by the city. He was a most interesting and instructive popular lecturer on astronomy, and a member of scientific societies in this country and Europe. Gen. M.'s mind was singularly clear and penetrating, he was prompt and decisive in action, undismayed by any dangers or difficulties, and nobly devoted to high aims. He published, 1846-48, a paper devoted to astronomical matters, revised Burritt's *Geography of the Heavens*, and wrote *The Planetary and Stellar Worlds*; *The Orbs of Heaven*; *A Concise Elementary Treatise of the Sun, Planets, Satellites, and Comets*; and *The Astronomy of the Bible*. His life was published 1865, by the Rev. P. C. Headley, and by his son, Frederick A Mitchel, 1887.

MITCHELL.

MITCHELL, DONALD GRANT, LL.D.: 1822, April 12, b. Norwich, Conn. He studied at Ellington (Conn.) Acad., and graduated from Yale 1841. For the next three years he worked on a farm for improvement of his health. He contributed articles to the *Albany Cultivator*, and drew a set of plans for farm buildings which won a silver medal from the N. Y. Agricultural Soc. He travelled in Europe 1844-46, and in 1847 published his first book, *Fresh Gleanings*. He studied law in New York, and, 1848, again went abroad; he was at Paris when the outbreak of that year occurred, and published his observations under the title *The Battle Summer*. *The Lorgnette* followed, 1850, and was soon succeeded by *Reveries of a Bachelor*, which was remarkably popular, and *Dream Life*, which won nearly equal fame. He was married, 1853, and immediately sailed to Venice, to which place he had been appointed U. S. consul. He published *Fudge Doings* 1854; and 1855 purchased Edgewood, a beautiful farm near New Haven, Conn., which has been made famous by his books on rural life, *My Farm of Edgewood* and *Wet Days at Edgewood*. Among his works are *Seven Stories*, *Doctor Johns*, *Rural Studies*, *Pictures of Edgewood*, *About Old Story-tellers*, *Out of Town Places*. At the Paris exposition, 1878, he was U. S. commissioner. He is a skilful landscape gardener, a member of the council of the art school, and prof. of belles-lettres, in Yale Univ. Several of his books have appeared under the authorship name 'Ik Marvel.'

MITCHELL, JOHN INSCHO: b. 1838, July 28, Tioga co., Penn. He attended the common schools, and when 18 years of age entered Lewisburg Univ., where he remained two years. After teaching school he became a student in a law office, but on the opening of the civil war he entered the Union army as 2d lieut. He was promoted capt. for bravery at Chancellorsville. After completing his studies he was admitted to the bar 1864, was dist. attorney 1868-71, in the latter year was elected to the Penn. house of representatives, and soon became leader of the republican side of the house. By successive re-elections he held this office till 1876, when he was elected representative to congress; he was re-elected 1878; declined re-nomination 1880. In 1881 he entered the U. S. senate for a term of six years.

MITCHELL.

MITCH'ELL, MARIA, PH.D., LL.D.: 1818, Aug. 1—1889, June 28; b. Nantucket, Mass.: astronomer. She was taught by her father, and in the school of Prof. Pierce in which she was also assistant teacher. When 18 years of age she became librarian of the Nantucket Athenæum, which position she held about 20 years, meanwhile pursuing mathematical and astronomical studies. From her early years she had assisted her father in making observations; and, 1847, Oct. 1, she discovered a comet for which she was awarded the prize of a gold medal by the king of Denmark. She made observations for the U. S. Coast Survey and compilations for the *Nautical Almanac*. During a tour in Europe, 1858, she visited the principal observatories and was an honored guest of the leading scientists. Upon her return she was presented with a fine telescope by the women of America. In 1865 she became director of the observatory and prof. of astronomy at Vassar College. Early in 1888 she resigned, on account of ill health and advancing years. Her resignation was not accepted, but she was given leave of absence. She was a member of several scientific societies and was the first woman to be elected to membership by the American Acad. of Arts and Sciences. She died at Lynn, Mass.

MITCH'ELL, PETER: 1824, Jan. 4; b. Newcastle, New Brunswick. He was educated in his native town, and, 1848, was admitted to the bar, but soon became interested in ship-building and politics. He was chosen, 1856, representative to the provincial parliament and after five years of service in that capacity was made life member of the legislative council. He was prominent in the movement for confederation of the provinces of Brit. America and for construction of the Intercolonial railroad, and was repeatedly chosen delegate to Canada and England in behalf of these projects. He served in the senate several years, but resigned 1872, and was minister of marine and fisheries under the Macdonald administration. He was prominent in the settlement, 1878, of the fishery troubles between Canada and the United States. He was elected representative, 1882, from his native county to the Dominion parliament, was one of the chief promoters of the Canada Pacific railway, and for several years has been pres. of the company publishing the *Montreal Herald*.

MITCH'ELL, SAMUEL AUGUSTUS: 1792, Mar. 30—1868, Dec. 20; b. Bristol, Conn. He became a popular teacher, and in middle life removed to Philadelphia, where he applied himself to the preparation of geographical works for schools, including text-books, atlases, and maps, of which he published 24 vols. His works had immense sale, and were the leading geographical school-books of the day. He published other works, among which were *General View of the World*, and *New Travellers' Guide through the United States*. He died in Philadelphia.

MITCHELL, SILAS WEIR, M.D., LL.D.: 1829, Feb. 15; b. Philadelphia. He graduated 1850 from the Jefferson Medical College, had charge of a hospital during the civil war, has been pres. of the Philadelphia College of Physicians, and is a member of various scientific societies. He has made careful investigation of nervous diseases, the poison of serpents, etc. Dr. M. has fine literary gifts, and besides his medical books and papers he has published a volume of poems and several novels.

MITCHELL'S PEAK: see BLACK MOUNTAINS.

MITE, n. *mīt* [OF, *mite*, the smallest of coins—from O.Dut. *mijte*, small: Dut. *mijt*, a very small coin: OE. *mynutis*, a very small coin: Port. *miudo*, little (see MINUTE 1)]: in *Scrip.*, a small coin, equal to about one-third of a farthing (about one-sixth of a cent): the OE. mite was of about the same value; a very little thing; a minute particle.

MITE, n. *mīt* [Dut. *mijte*; Sp. *mita*; F. *mite*, a mite: prov. Sw. *smit*; Gael. *smiot*, a particle: Gr. *midas*, a little creature that eats beans]: small insect not easily seen by the naked eye, found in cheese and many other substances. MITY, a. *mīt'i*, containing mites.—*Mite* is a name given to the *Acarides* generally (see ACARUS); sometimes only to those of them which have the feet formed for walking, and the mouth furnished, not with a sucker formed of lancet-like plates, as in the Ticks (q.v.), but with mandibles. All are small creatures; the species are very numerous; they feed chiefly on decaying animal and vegetable substances, or are parasitical on quadrupeds, birds, and insects. The CHEESE M. (*Acarus domesticus*, figured in the article ACARUS) is one of the best known species; another is the FLOUR M. (*A. farinæ*), too common among flour, in both of which the body is covered with hairs very large in proportion to its size, and capable of a considerable amount of motion. The SUGAR M. (*A. saccharinus*) swarms in almost all soft sugar; but refined and crystallized sugar seems to defy its mandibles, and is free of it. The surface of jelly and preserves, when it has begun to become dry, is often covered with multitudes of very small mites. A species of M. is the cause of Itch (q.v.); and many of the lower animals are infested by parasites of this tribe. Beetles may often be seen absolutely loaded by a species which preys on them; and bird-fanciers regard with the utmost horror the RED M., which lurks in crevices of cages and aviaries, and sucks the blood, and eats the feathers of their inmates.

MITTER: see MITRE.

MITFORD, *mīt'ford*, MARY RUSSELL: English authoress: 1786, Dec. 16—1855, Jan. 10; b. Alresford, Hants; only child of a physician. At the age of ten, she was sent to a boarding-school at Chelsea, and also placed under the guidance and tuition of Miss Rowden, a lady of a literary turn, who had educated Lady Caroline Lamb, and was afterward instructress of Miss Landon and of Fanny

MITFORD.

Kemble. During the five years that she spent at Chelsea, she read with avidity, studying the tragic authors of France, Shakespeare, and the early dramatists of England. At the age of 15, she returned home, and before she was 20, she published three vols. of poetry. These having been severely castigated by the *Quarterly Review*, she applied herself to writing tales and sketches for the magazines. The profession which she had adopted from taste she continued from necessity; for her father, an idle and spendthrift gentleman, had exhausted a fortune of £20,000 drawn as a lottery prize, which left him dependent on his daughter, who exercised over him a motherly care, and indulged him in the exactions which were natural to his easy good-nature. The first vol. of *Our Village* appeared 1824, and the five vols. completed 1832. Of the more important of her dramatic works, *Julian* was performed first 1823; *Foscari* 1826; and *Rienzi* 1828—all, especially the last, with success. Among her other important works, are *Recollections of a Literary Life* (3 vols. 1852); *Atherton* (a novel, 3 vols. 1854) and *other Tales*. Miss M. published a collected ed. of her dramatic works, 2 vols. 1854. In 1838, she received a pension from govt., but neither this, nor the growing ill-health of her later years, induced her to relax her literary industry. She died at her residence, Swallowfield Cottage, near Reading. Successful both as compiler and as author, Miss M. produced many interesting volumes; but her fame—if the admiring respect for an amiable lady and a woman of graceful literary genius may be so called—rests chiefly on the sketches of country life which compose *Our Village*. These sketches are memorable chiefly for their style, which is unaffected, spontaneous, vivacious, genial, and humorous, revealing a charming character. Five vols. of her *Life and Letters* appeared 1870–72; and two vols. of *Letters to her*, 1882.

MITFORD, WILLIAM: 1744, Feb. 10—1827, Feb. 8; 5. London. He studied at Queen's College, Oxford, but left the univ. without taking his degree. In 1761, he succeeded to the family estate; and 1769 became a capt. in the South Hampshire militia. M.'s first work, *An Inquiry into the Principles of Harmony in Languages, and of the Mechanism of Verse, Modern and Ancient*, appeared 1774; but by far his most important publication was his *History of Greece*, the first vol. of which appeared 1784, and the last 1818; a pugnacious, opinionated, and even fanatical production. The author is an intense hater of democracy, and can see in Philip of Macedon nothing but a great statesman, and in Demosthenes, nothing but an oratorical demagogue. Yet his zeal led him for substantiating his views, to search minutely and critically certain unexplored portions of Greek history; this gave M.'s work a high place in the opinion of scholars until the appearance of Thirlwall and Grote.

MITHRADATES.

MITHRADATES, *mīth-ra-dā'tēz*, improperly, MITHRIDATES [from Persian *Mithras* (q.v.) or *Mithra*, 'the sun,' and an Aryan root *da*, to give; hence 'sun-given' or 'sun-born']: name of several kings of Pontus, Armenia, Commagene, Parthia, and the Bosporus; all of whom have sunk into insignificance, with the exception of Mithradates VI. of Pontus, surnamed EUPATOR and DIONYSUS, but more generally known as M. THE GREAT: prob. abt. B.C. 132-63 (reigned about B.C. 120-63). Little is known of his early career. He succeeded his father before 13 years of age, and soon subdued the tribes who bordered on the Euxine, as far as the Chersonesus Taurica (Crimea); and after the death of Parysatis, incorporated the kingdom of the Bosporus with his dominions. The jealous behavior of the Romans and the promptings of his own ambitious spirit incited him to invade Cappadocia and Bithynia, but a wholesome fear of the power of the Great Republic induced him to restore his conquests. The *First Mithridatic War* was commenced by the king of Bithynia B.C. 88, who, at the instigation of the Romans, invaded Pontus. M. sent an ambassador to Rome to complain of this treatment, but he was sent back with an evasive reply. M. immediately began hostilities, and his generals repeatedly defeated the Asiatic levies of the Romans, and he himself took possession of Bithynia, Cappadocia, Phrygia, and the Roman possessions in Asia Minor, the inhabitants of which last hailed him as deliverer. By his orders, a great massacre of the Romans took place, in which, according to one account, 80,000, according to another 150,000 were slain. He also sent three powerful armies to aid the Greeks in their rebellion, but the disastrous battles of Chæronæa and Orchomenus broke his power in that country. He was driven from Pergamus B.C. 85 by Flavius Fimbria, and reduced to the necessity of making peace with Sulla, relinquishing all his conquests in Asia, giving up 70 war-galleys to the Romans, and paying 2,000 talents. The wanton aggressions of Murena, Roman legate, gave rise to the *Second Mithridatic War*, B.C. 83. M. was wholly successful in this war, but peace was concluded on the *status quo*, B.C. 81. M. felt, however, that this was merely a truce, and lost no time in preparing for a third contest, in alliance with Tigranes, King of Armenia, the next most powerful monarch of w. Asia. Tigranes seized Cappadocia B.C. 76, and M., in the following year, invaded Bithynia, commencing the *Third Mithridatic War*. M. formed an alliance with Sertorius (q.v.), and obtained the services of Roman officers of the Marian party, who trained his army after the Roman manner. The arms of M. were at first successful; but afterward the Roman consul Lucullus (q.v.) compelled him to take refuge with Tigranes, B.C. 72. Lucullus then conquered Pontus, defeated Tigranes, B.C. 69, at Tigranocerta, and both Tigranes and M. at Artaxata, B.C. 68. M., however, recovered possession of Pontus. After the war had

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lingered some time, Cneius Pompeius (see POMPEY), completed the work of Lucullus, defeating M. on the Euphrates B.C. 66, and compelling him to flee to the Bosphorus. Here his indomitable spirit prompted him to a new scheme of vengeance, but it was frustrated by the rebellion of his son, Pharnaces, who besieged him in Panticapæum. Deeming his cause hopeless, M. put an end to his own life. M. was a specimen of the true eastern despot; he had the ability that is given by irresponsible power, unbounded ambition, and mereiless hate of foes, and that manifests itself in courage, extraordinary energy, and perseverance. His treachery and cruelty were frightful; he murdered his mother, his sons, his sister, who was also his wife, his concubines, and his most intimate friends. Superstition became to him a science; he was a great student of magic, and the accounts of him which pass for history read like extracts from the *Arabian Nights*. His physical stature and strength were wonderful. His want of success was owing not altogether to his defects as a general, but largely to the impossibility of raising and training an army of Asiatics capable of coping with the Roman legions; and his system of tactics during the third Mithridatic war plainly shows his conviction of this fact. He had received a Greek education with its outward polish at Sinope, could speak 22 different languages and dialects, and possessed considerable love for the arts, of which his magnificent collections of pictures, statues, and engraved gems were a proof. In the estimation of the Romans, he was the most formidable opponent they ever encountered, and occasional reports of his successes spread terror among them.

MITHRAS, *mīth'ras* (cf. Sanskrit *Mitram*, friend): highest of the 28 second-class divinities of the anc. Persian Pantheon, the *Ized* (Zend. *Yazata*) or genius of the bright heaven or the day, and ruler of the universe. Later, M. became quite identified with the sun as a god. Protector and supporter of man in this life, he was believed to watch over his soul in the next, defending it against the impure spirits, and transferring it into the realms of eternal bliss. In the Persian mythology, he is all-seeing and all-hearing, and, armed with a club—his weapon against Ahriman and the evil *Devs*—he unceasingly 'runs his course' between heaven and earth. The ancient monuments represent him as a beautiful youth, in Phrygian garb, kneeling on an ox, into whose neck he plunges a knife; several minor, varying, allegorical emblems of the sun and his course, surrounding the group. At times, he is represented as a lion, or the head of a lion. The most important of his many festivals was his birthday, celebrated Dec. 25. The worship of M. early found its way into Rome; it was regularly established by Trajan about A.D. 100, and the mysteries of M. (*Hierocoracica*, *Coracica Sacra*), which fell in the spring equinox, were famous even among the many Roman festivals. The ceremonies observed in the initiation

MITIGATE—MITRAILLEUSE.

to these mysteries—symbolical of the struggle between Ahriman and Ormuzd (the Good and the Evil)—were extraordinary and even dangerous. Baptism and the partaking of a mystical liquid, consisting of flour and water, to be drunk with the utterance of sacred formulas, were among the inaugurative acts. The seven degrees—according to the number of the planets—were, 1. Soldiers: 2. Lions (in the case of men), or Hyenas (in that of women): 3. Ravens: 4. Degree of *Perses*: 5. of *Oromios*: 6. of *Helios*: 7. of Fathers—the highest—called also Eagles and Hawks. At first, it was a merry worship—thus the king of Persia was allowed to become drunk only on the Feast of the Mysteries; but the solemnities gradually assumed a rigorous aspect. From Persia, the cultus of M. and the mysteries were imported into Asia Minor, Syria, Palestine, etc., and it is probable that in some parts human sacrifices were connected with it. Through Rome, where this worship, after many vain endeavors, was finally suppressed A.D. 378, it may be presumed that it found its way into w. and n. Europe; and many tokens of its former existence, e.g., in Germany, are still found, such as the M. monuments at Hedernheim, near Frankfurt-on-the-Maine, and at other places. Among chief authorities on this subject are Anquetil du Perron, Creuzer, Silvestre de Sacy, Lajard, O. Müller (*Denkmäler d. alten Kunst*). See GUEBRES: PARSEES: ZENDAVESTA.

MITIGATE, v. *mīt'ī-gāt* [L. *mitigatus*, softened, allayed or eased—from *mitis*, soft, mild: It. *mitigare*: F. *mitiger*]: to alleviate or ease, as sufferings; to reduce or lessen, as a penalty or a disease; to soften; to appease; to soothe. MITIGATING, imp.: ADJ. alleviating; moderating. MITIGATED, pp.: ADJ. alleviated; moderated. MITIGANT, a. *mīt'ī-gānt*, softening; diminishing or easing, as pain: N. that which eases or lessens. MITIGATOR, n. *-gā-tēr*, one who or that which mitigates. MITIGABLE, a. *mīt'ī-gā-bl*, that may be alleviated or lessened. MITIGATION, n. *-gā'shūn* [F.—L.]: the act of mitigating; the diminution or lessening of anything painful, severe, or calamitous. MITIGATIVE, a. *-gā-tīv*, tending to lessen or alleviate.—SYN. of 'mitigate': to allay; alleviate; pacify; relieve; assuage; calm; abate; cool.

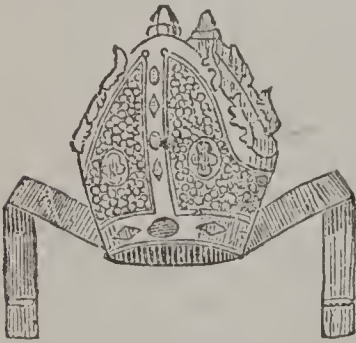
MITRAILLEUSE, n. *mīt'rāl-yéz'*, MITRAILLEUS'ES, n. plu. *-yāz'ēz* [F.—from *mitraille*, case or grape shot: *mitrailer*, to fire with grape or case shot]: a many-barrelled gun, having the barrels laid together like a fagot of sticks, and securely attached to each other, loaded with great quickness by an apparatus at the breech, and discharged each barrel singly, or the whole nearly simultaneously: see REVOLVER: GATLING GUN. Also sometimes used, MITRAILLEUR, n. *mīt'rāl-yār'*. MITRAILLE, n. *mīt-rāl'*, grape-shot.

MITRAL--MITRE.

MITRAL, a. *mī'trāl* [L. and Gr. *mitra*, a head-dress, a mitre]: having the form of a mitre; in *anat.*, applied to a valve attached to the circumference of the left auriculo-ventricular orifice, whose flaps are supposed to resemble the segment of a bishop's mitre; the bicuspid valve.

MITRE, n. *mī'tēr* [F. *mitre*, an episcopal crown—from L. and Gr. *mitra*, a headband, a turban: It. *mitra*]: in *R. Cath. Ch.*, a sort of crown worn on solemn occasions by archbishops, bishops, and sometimes by abbots; episcopal dignity; the junction of objects, e.g., the point or line of union of moldings meeting at an angle usually of 45°: V. to adorn with a mitre; to unite at an angle of 45°. **MITRING**, imp. *mī'tring*. **MITRED**, pp. *mī'térd*: **ADJ.** wearing or possessing a mitre; episcopal; cut or jointed to meet at an angle. **MITRAL**, a. *mī'trāl*, mitre-shaped; pertaining to a mitre. **MITRE-BOX**, a box or trough with vertical cuts through the sides to guide the saw in cutting work to form mitre-joints. **MITRE-SQUARE**, an immovable bevel for striking an angle of 45°. **MITRE-WHEELS**, in *mech.*, a pair of bevel-wheels of equal diameter working into each other, usually with their axes at right angles.

MITRE: head-dress worn in solemn church services by bishops, abbots, and certain other prelates in the Western Church. The name, as probably the ornament itself, is borrowed from the orientals, though, in its present form, it is not in use in the Greek Church, or in any other of the churches of the various eastern rites. The western M. is a tall, tongue-shaped cap, terminating in a twofold point supposed to symbolize the 'cloven



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tongues' in the form of which the Holy Spirit was imparted to the apostles (Acts ii. 3), and is furnished with two flaps, which fall behind over the shoulders. Opinion is divided as to the date at which the M. came first into use. Eusebius, Gregory of Nazianzus, Epiphanius, and others speak of an ornamented head-dress, worn in the church; but there is no very early monument or pictorial representation which exhibits any head-covering at all resembling the modern M. From the 9th c., however, it is found in use, though not universally; and instances are recorded in which the popes grant permission to certain bishops to wear the M.; e.g., Leo IV. to Anschar, Bp. of Hamburg, 9th c. The material used in the M. is very various, often consisting of most costly stuffs, studded with gold and precious stones. The color and material differ according to the festival or the service in which the M. is used, and there is a special prayer in the consecration service of bishops, used in investing the new bishop with his mitre. The M. of the pope is of peculiar form, and is called by the name of *Tiara* (q.v.). Although the mitre properly belongs to bishops

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only, its use is also permitted by special privilege to certain abbots, to provosts of some distinguished cathedral chapters, and to a few other dignitaries. See Binterim, *Denkwürdigkeiten der Kirche*, 1 B. 2 Th. 348.

The M., as an ornament, seems to have descended in the earliest times from bishop to bishop. Among the Cottonian mss. is an order, dated July 1, 4 Henry VI., for the delivery to Abp. Chicheley of the M. worn by his predecessor. It was in some cases very costly. In England, after the Reformation, the M. was no longer a part of the episcopal costume till 1885, when it was resumed by the new Bp. of Lincoln; but in heraldry it is placed over the shield of an abp. or bp., instead of a crest. The M. of a bp. has its lower rim surrounded with a fillet of gold; but the Abps. of Canterbury and York are in the practice of encircling theirs with a ducal coronet, a usage of late date and doubtful propriety. The Bp. of Durham surrounds his M. with an earl's coronet, in consequence of being titular Count Palatine of Durham, and Earl of Sedburgh. Before the custom was introduced of bishops impaling the insignia of their sees with their family arms, they sometimes differenced their paternal coat by the addition of a M. Mitres are rare as a charge in heraldry, but are sometimes borne as a crest, particularly in Germany, to indicate that the bearers were feudatories, or dependencies of ancient abbeys.

MITRE SHELL: name for the shells of several species of *Mitra*, genus of gasteropods belonging to the family *Volutidæ*. These shells are of great beauty, especially that known as the bishop's mitre shell. The shell of *Mitra* is fusiform, thick, spire elevated, acute; aperture small, notched in front; columella obliquely plaited; operculum very small. The animal has a long proboscis; and, when irritated, emits a purple liquid having a very offensive smell. The eyes are situated on the tentacles or at their base. Over 100 fossil and 400 recent species have been described. In the bishop's (*M. episcopalis*), the animal has a narrow foot, compressed at its root, nearly square and slightly articulated in front with a margined furrow, and pointed behind; eyes sessile at the base of the tentacles; the proboscis twice the length of the shell. The shell is turreted, smooth, white, spotted with bright red; pillar four plaited; outer lip denticulated at its lower part; epidermis thin. It is found in E. Indian seas and islands of the S. Sea. The different species are found at depths varying from the surface to 17 fathoms, on reefs, sandy mud, and sands. They all are inhabitants of warm countries.

MITRIFORM, a. *mī'trī-fawrm* [L. *mitra*, a headband; *forma*, shape]: in *bot.*, shaped like a mitre; conical; hollow and open at the base.

MITSCHERLICH, *mīt'shër-lich*, EILHARDT: Prussian chemist: 1794, Jan. 7—1863, Aug. 28; b. Neuende, near Jena. At the Univ. of Heidelberg he studied history, philology, and oriental languages; and later at Paris and Göttingen. At Göttingen (1814 or 15) he seems first to have turned his attention to geology and mineralogy, chemistry and physics; and at Berlin, 1818, he selected chemistry as his special study. His observations on the striking similarity between the crystalline form and the chemical composition of the arseniates and the phosphates, led to his discovery of the law of Isomorphism (q.v.), the importance of which was so fully recognized by Berzelius, that he invited the young chemist, 1819, to Stockholm, where he studied till 1821, when, on the death of Klaproth, he was, on recommendation of Berzelius, appointed to the vacant chair of chemistry at Berlin. One of his earliest discoveries after his appointment was that of the double crystalline form of sulphur, the first observed case of Dimorphism: see DIMORPHISM. His investigations regarding the formation of artificial minerals, and his memoirs on Benzine and on the Formation of Ether are among his most important contributions to chemistry; but mainly on the discovery of Isomorphism and Dimorphism his reputation will finally rest. His principal work is *Lehrbuch der Chemie*, begun 1829, concluded 1841. It has passed through five editions, and is especially valuable for the clear and simple way in which he has brought mathematics and physics to bear upon the subject. He was an honorary member of almost all the great scientific societies, and received the gold medal from the Royal Soc. of London for his discovery of the law of Isomorphism. He died at Berlin.

MITTAU, *mīt'tow*, or MIRAU, *mē'tow*: chief town of the govt. of Courland, European Russia; on the right bank of the Aa, 25 m. s.w. of Riga; founded 1271 by the grand master of the Teutonic Knights. It was annexed to Russia 1795. The majority of the people are Germans by birth or descent, 1,000 are Jews, and only a few Russians. The town is indifferently built, the houses being chiefly of wood, and painted green or brown. The most important buildings are the old castle—now the seat of the gov. of the province—four churches, an astronomical observatory, a public library, a museum, and a number of educational and charitable institutions. As regards commerce and industry, the town occupies only the third place in the govt., its principal product being articles of japanned iron and tin; there is export trade in hemp, flax, and corn. M. is the winter residence of the gentry of the surrounding country, and was for some time the abode of Louis XVIII. Pop. (1880) 23,847.

MITTENS, n. plu. *mīt'nz* [F. *mitaine*, a winter glove: comp. Gael. *mutan*, a muff, a thick glove; *mutag* and *miotag*, a glove without fingers]: rough coverings for the hands to protect them from the cold; gloves without a separate covering for each finger; gloves without fingers. TO HANDLE WITHOUT MITTENS, to use roughly.

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MISSOURI, *mīs-sô'ri*: a state; one of the United States of America; 11th in order of admission into the Union; 5th in population in 1880, 5th in 1890, and 5th in 1900; 10th in railroad mileage; 7th in value of manufacturers in both 1890 and 1900; in 1902 3d in production of corn, 2d in hay, 2d in number of mules. Popularly known as the 'Pennsylvania of the west'; named from the Missouri river.

Location and Area.—M. is in lat. 36° — $40^{\circ} 30'$ n., long. $89^{\circ} 2'$ — $95^{\circ} 42'$ w.; bounded n. by Ia., e. by Ill., Ky., and Tenn., s. by Ark., w. by Ind. Terr., Kan., and Neb.; extreme length n. and s. 277 m., extreme breadth 312 m., mean breadth 208–244 m.; 69,415 sq. m. (44,425,600 acres); Mississippi-river frontage about 500 m.; cap. Jefferson City.

Topography.—In general, the n. portion is level, and the s. undulating and rising gradually to the Ozark mountains. Along the Mississippi river, from Cape Girardeau to the mouth of the St. François river, lies the Great Swamp, with more than 100 m. in M., the most extensive of the numerous swamps in this region, and a marked feature of the M. bottom-lands. The bottom also contains many small islands, lakes, and lagoons, some of the former being above inundation-mark. Where there is any considerable amount of soil in this region, it is very fertile. In the basin of the Osage river the surface becomes rolling prairie, and above it bears noticeable forest growths; while the valley of the Missouri river has a rich alluvial soil, and abounds in forest trees of large size. Broad valleys stretch between the Mississippi and Missouri rivers; woodlands occur chiefly on the margins of water-courses; and the treeless, upland prairies comprise about nine-tenths of the entire state. The drainage of M. is chiefly by the Mississippi river, which forms its entire e. boundary, and is navigable the year round, excepting when obstructed by ice; the Missouri, which nearly bisects the state, flowing from the n.w. corner to the Mississippi, to a point just below Alton, Ill., and navigable like the Mississippi; the Osage, which flows into the Missouri on the s., and is navigable for small steam-boats half the year; and the St. François, White, Black, Gasconade, Grand, Chariton (all navigable for small boats in the open season), Salt, South Grand, Platte, Nodaway, Sac, Meramec, Cuivre, Castor, and Niangua (non-navigable streams). The Missouri river forms the w. boundary of M. for nearly 200 m., and is a rapid, turbid stream, more than half a m. wide at its mouth, and through the greater part of its course wider still; and though draining an enormous stretch of country and receiving many large tributaries, it is exceedingly shallow at certain seasons. The Des Moines river forms a part of the n.e. boundary of the state.

Climate.—M. is subject to great extremes of heat and cold, the thermometer ranging from 100° above zero to

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8° below; but these extremes are infrequent and of short duration, and the climate is healthful, with a generally dry, pure, salubrious air. The summers and winters of M. closely resemble those of Miss. The temperature at St. Louis ranges in winter from 30° to 43°, and in summer from 75° to 80°, with average rainfall 42 inches; annual mean temperature at Jefferson Barracks 55.46°, rainfall 37.83 inches. The river-bottoms and swamps in the s.e. are malarious, and the Missouri river for several weeks in winter is generally frozen so hard as to be safely crossed by loaded wagons.

Geology.—The main formations are quaternary, with alluvium, bluff, and drift; carboniferous or coal measures; Devonian rocks, Hamilton and Onondaga groups; upper Silurian, in four groups, and lower, in three; magnesian limestone, three groups; and eozoic or archaic rocks. The mineral riches of M. are greater than those of any other state. Some gold is found in the drift-sands of the n. portion, and some silver in combination with lead in the galena ores. The coal measures predominate, and are followed by iron (bog in the s.e.; brown hematite in the s.; red hematite in the coal measures; spathic ores in the coal measures and in Phelps co.; specular oxide in the Iron Mountain, Shepherd Mountain, Simon Mountain, and the Pilot Knob districts; sulphurets in the coal measures; and sulphates there and in abandoned coal mines); lead, chiefly in the s.e. and the s.w. portions; nickel and cobalt, in Madison co. and the St. Joseph mines; and millerite, near St. Louis. Besides these, large quantities of wolfram, carbonate of lime, pearl-spar, fluor-spar, felspar, sulphate of baryta, gypsum, mica, asbestos (in Madison co.), mineral tar, potter's clay, fire-clay, kaolin, sand-glass, hydraulic lime and cement, saltpetre, grindstones, white and colored marbles, slates, millstones, granite, and a variety of building-stones, are found. The principal mineral springs are sulphurous, saline, and chalybeate.

Zoölogy.—The mountains abound in bears, panthers, wild cats, wolves, raccoons, opossums, and foxes; game animals are deer, rabbits, squirrels, hares, wild turkeys, quails, pigeons, prairie hens; eagles, vultures, owls, and hawks are frequently seen; wild geese, ducks, brant, teal, herons, and swans are plentiful in season in the principal rivers and swamps; and snakes, lizards, toads, frogs, and turtles frequent the bottoms and swamp-lands. There is also a large variety of song and plumage birds.

Agriculture.—In 1880 the farm-lands covered 27,879,276 acres (of which 16,745,031 were improved); comprised 215,575 farms, valued with fences and buildings at \$375,633,307; contained implements and machinery valued at \$18,103,074; used live-stock valued at \$95,785,282; cost for repairs and new buildings \$4,614,416, and fertilizers \$109,724; and yielded products valued at \$95,912,660. The principal products were: Indian corn 202,414,413 bushels; oats 20,670,958; rye 535,426; wheat 24,966,627; cotton 20,318 bales; wool 7,313,924 lbs.; barley 123,031

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bushels; buckwheat 57,640; Irish potatoes 4,189,694; sweet potatoes 431,484; hay 1,077,458 tons; tobacco 12,015,657 lbs.; butter 28,572,124; and cheese 283,484. The live-stock comprised 667,776 horses; 192,027 mules and asses; 9,020 working oxen; 661,405 milch cows; 1,410,507 other cattle; 1,411,298 sheep; and 4,553,123 swine. In 1890 the number of farms was 238,043, with a total acreage of 30,780,290 acres, or an average of 129 acres per farm. Of this 19,792,313 acres were improved and 10,987,977 acres unimproved. The value of land, fences, and buildings was \$625,858,361; implements and machinery \$21,830,719; live stock on hand, June 1, \$138,701,173; farm products of the year \$109,751,024. Among these products were: Indian corn 196,999,016 bu., oats 39,820,149 bu., wheat 30,113,821 bu., cotton 15,856 bales, sorghum molasses 2,721,240 gals., hay 3,567,635 tons, tobacco 9,424,823 lbs., Irish potatoes 8,188,921 bu., wool 4,040,084 lbs., milk 193,931,103 gals., butter 43,108,521 lbs., cheese 288,620 lbs. In 1895 M. had 6,613,118 acres in corn, producing 238,072,248 bu., valued at \$47,614,450; wheat 1,541,664 acres, 18,499,968 bu., value \$9,434,984. In 1900 the farms numbered 284,886, comprised 33,997,813 acres, and were valued, with improvements, machinery and stock, at \$1,033,121,897.

Manufactures.—M. had (1890) 14,052 manufacturing establishments, with \$189,558,546 capital, employing 143,139 hands, paying \$76,417,364 in wages, requiring \$177,582,382 in raw materials and yielding \$324,561,993 in products. The leading industries were flouring and grist mill products, establishments 710, employees 3,855, wages \$1,811,395, materials \$29,210,639, products \$34,486,795; slaughtering and meat packing (retail), establishments 83, employees 1,486, wages \$896,042, materials \$15,190,663, products \$18,410,851; malt liquors, establishments 30, employees 3,117, wages \$2,441,615, materials \$6,563,536, products \$16,954,137; tobacco, chewing, smoking, and snuff, establishments 26, employees 3,384, wages \$1,518,683, materials \$8,030,780, products \$15,428,764; printing and publishing, establishments 778, employees 8,766, wages \$5,361,268, materials \$3,503,733, products \$13,004,440; foundry and machine-shop products, establishments 186, employees 7,339, wages \$4,538,346, materials \$5,819,009, products \$13,080,773; clothing, men's, establishments 541, employees 9,918, wages \$4,151,831, materials \$6,517,155, products \$13,069,951; lumber and planing mill products, establishments 826, employees 8,298, wages \$3,151,471, materials \$7,456,429, products \$13,289,179; cars, railroad and street, establishments 22, employees 2,641, wages \$1,703,197, materials \$3,215,040, products \$5,319,840; boots and shoes, factory product, establishments 29, employees 2,813, wages \$1,247,292, materials \$2,521,027, products \$4,841,004; furniture, establishments 194, employees 2,501, wages \$1,464,386, materials \$2,104,214, products \$4,508,565; paints, establishments 21, employees 560, wages \$381,348, materials \$2,255,767, products \$3,496,618; patent medicines and compounds, establishments 66, employees 672, wages \$444,118, materials \$761,127, products \$2,518,816; tobacco,

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cigars and cigarettes, establishments 404, employees 1,726, wages \$859,493, materials \$778,492, products \$2,154,882; brick and tile, establishments 232, employees 4,834, wages \$1,706,492, materials \$709,626, products \$3,503,906; chemicals, establishments 19, employees 578, wages \$356,239, materials \$1,600,083, products \$2,736,960; coffee and spice roasting and grinding, establishments 15, employees 344, wages \$219,113, materials \$3,290,476, products \$3,892,792; confectionery, establishments 75, employees 1,656, wages \$695,109, materials \$2,120,762, products \$3,584,953; iron and steel, establishments 6, employees 899, wages \$452,766, materials \$1,461,853, products \$2,241,108; iron work, establishments 44, employees 1,350, wages \$846,441, materials \$1,110,996, products \$2,646,336; roofing and roofing materials, establishments 120, employees 861, wages \$549,720, materials \$955,150, products \$1,981,764; linseed materials \$1,370,267, products \$1,795,401. In 1900 there were 18,754 manufactories, with \$249,888,581 capital, and products valued at \$385,492,784.

Commerce.—The exports of M. (1896) were: Kansas City \$457,567; St. Louis \$3,013,864; St. Joseph \$172,523; total \$3,643,954. The customs receipts were (1896) \$6,959,915.32. The prod. of spirits was (1896) 962,621 gals., (1895) 1,429,491, malt liquors, (1896) 2,262,048 bbl., (1895) 2,139,224 bbl. In 1896 M. had 197 vessels licensed and enrolled, 115,611.50 tonnage; of these 108, with 80,824.64 tonnage, were steam vessels; and 89, with 80,924.64 tonnage, barges. During the year 4 steam vessels, with 1,094.70 tonnage and 1 barge of 28.97 tonnage were built in the state. M. has a large domestic commerce, shipping enormous quantities of cereals, pork, beef, live-stock, manufactures, and merchandise, by rail and river, from St. Louis; and grain, live-stock, wool, hides and pelts, ores, pig-lead, bullion, and packed meat from Kansas City, the latter being the great cattle market of the s. w. since 1868. The imports of merchandise for 1902 at the custom houses at Kansas City, St. Louis, and St. Joseph agg. in value \$5,416,523.

Mining.—The coal prod. of M. (bitumin.) was (1892) 3,017,285 tons, (1893) 3,190,442 t., (1894) 2,383,322 t., (1901) 3,394,721. The prod. of pig iron was 57,020 tons in 1892, 27,518 tons in 1895, and 12,548 tons in 1896; shipments of iron ore (1894) 14,147 tons, (1895) 49,454 tons, (1896) 26,102 tons; lead ore production (1889) 88,964,146 lbs., zinc ore 186,262,308 lbs. The coal measures cover 22,995 sq. m., mainly in the n., n.w., and w. parts of the state; include the 4 subdivisions of the upper carboniferous formation and 6 successive deposits of the lower carboniferous, some of the latter rich in fossils; and comprise 12,420 sq. m. of exposed lower measures, 8,406 sq. m. of upper or barren measures, and 2,000 sq. m. of exposed middle measures. Coal may be mined within 200 ft. of the surface, in an area of about 7,000 sq. m. The upper measures aggregate 1,317 ft. in thickness; the middle 324 ft.; the lower 250–300 ft. Iron in some

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form is found in nearly every co.; but the most important fields are those known as the Iron Mountain and the S.E., S.W., and W. districts. The Iron Mountain district, in Iron and St. François cos., about 80 m. s. of St. Louis, has 2 noted deposits of specular oxide, Iron Mountain proper and Pilot Knob. The former has yielded more than 3,000,000 tons of ore since 1845, the latter more than 1,000,000 tons since 1847, and both give evidence of containing many times their total output. Shepherd Mountain, Simmon Mountain, and the Meramec mines also contain very large deposits. The lead mines of M. rank next in value, and for several years have yielded more than half the entire product of the United States. The richest mines are the La Motte, which is known to have been operated 150 years ago and to have yielded as much as 1,000,000 lbs. per annum for many years, and the Vallé and Perry mines, which have been nearly as productive. The production of copper, formerly very large and steady, has been falling off for several years, because the cheapness of the metal and the great output of the Lake Superior region have discouraged extensive operations. Five companies were engaged in mining zinc 1884, supplied 34 furnaces, and produced 12,500 tons.

Quarries.—In 1890 M. had 150 stone quarries, yielding products valued at \$2,516,159, requiring 4,029 employees, paying \$1,599,872 in wages and using \$2,957,497 capital. Of granite the production was 1,264,317 cu. ft., value \$500,642; limestone, 123 quarries, value of product \$1,859,960, for building stone 11,083,370 cu. ft.; for lime 1,144,962 bbl.; sandstone, 17 quarries, production 734,370 cu. ft., value \$155,557, number employed 192, wages \$69,549, capital \$298,380. Among the marble deposits is a notable cave, the entrance to which is on the summit of Roark Mountain, in Stone co., 18 m. s.e. of Galena and 3 m. n. of White river. It contains a beautiful chamber 150 ft. high; a stalagmite 300 ft. in diameter at the base, 130 ft. high; and within the stalagmite, 60 ft. from its base, a chamber 30x40 ft., and a pool of clear, cool water 15 ft. in diameter. The top of the main chamber is dome-shaped, and about two-thirds the way up is an attractive tracery of fringe extending entirely around it. The cave has numerous striking features, to which fanciful names have been given.

Railroads.—The first railroad was opened 1852, with 38 m. of track. The development since has been: (1855) 139 m.; (1860) 817; (1865) 925; (1870) 2,000; (1875) 2,905; (1880) 4,007—2,000 m. of steel track—gross earnings \$21,000,000; (1884) 5,360; (1890) 6,142; (1893) 6,464; (1894) 6,517; (1895) 6,567; (1896) 6,575. In 1895 the total capital stock was \$275,201,018, funded debt \$301,568,556, total investment \$597,635,002; gross earnings, passengers \$10,442,626, freight \$37,568,014, all sources \$53,776,618; net earnings \$14,434,465, interest paid on bonds \$14,250,593, dividends \$869,478. The principal trunk lines are the Wabash St. Louis and Pacific, Chicago Rock Island and Pacific, Missouri Kansas and Texas, Missouri Pacific, and the St. Louis

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Iron Mountain and Southern. Several iron railroad bridges span the Mississippi and Missouri rivers, 34 different railroad lines enter St. Louis alone, and there is a notable wire suspension-bridge across the Mississippi river at that city.

Religion.—In 1890 M. had 8,064 church organizations, 6,121 church buildings, seating 1,859,589, valued at \$19,-663,737; there were 735,839 church members or 27.47 per cent of the entire population. The leading churches were: Regular Bapt. (South), 1,636 organizations, 1,265 churches, value \$2,386,898, and 121,985 members; Bapt. (colored), 234 organizations, 212 churches, value \$400,518, and 18,613 members; Free-will Bapt., 108 organizations, 56 churches, value \$59,825, and 4,752 members; Prim. Bapt., 161 organizations, 116 churches, value \$93,025, and 4,431 members; Cong., 80 organizations, 69 churches, value \$650,344, and 7,617 members; Disciples of Christ, 1,120 organizations, 830 churches, value \$1,632,531, and 97,773 members; German Evang., 124 organizations, 115 churches, value \$70,000, and 25,676 members; Lutherans, 160 organizations, 148 churches, value \$890,090, and 27,099 members; Meth. Epis., 905 organizations, 38 churches, value \$1,835,840, and 58,285 members; Meth. Epis. (South), 1,230 organizations, 163 churches, value \$2,046,389, and 86,466 members; Prot. Meth., 90 organizations, 38 churches, value \$29,900, and 3,359 members; African Meth., 128 organizations, 126 churches, value \$309,429, and 12,579 members; Presb. (North), 207 organizations, 193 churches, value \$1,328,700, and 17,272 members; Presb. (South), 143 organizations, 116 churches, value \$753,490, and 10,363 members; Cumberland Presb., 403 organizations, 280 churches, value \$589,262, and 24,461 members; Prot. Epis., 113 organizations, 84 churches, value \$977,600, and 8,953 members; United Brethren, 105 organizations, 45 churches, value \$47,825, and 4,361 members; Rom. Catholics, 442 organizations, 402 churches, value \$4,070,370, and 162,864 members; Christian Union, 56 organizations, 31 churches, value \$39,050, and 3,926 members; Jewish, 17 organizations, 8 churches, value \$241,800, and 4,450 members; Latter Day Saints, 42 organizations, 18 churches, value \$58,650 and 3,189 members.

Education.—In 1895 M. had an estimated school population (5-18 years) of 917,100; school enrolment, 644,577, or 70.29 per cent. of the school population; average daily attendance, 426,610, or 66.17 per cent. of enrolment; average number of days taught, 140; teachers, 14,487 (male, 5,814; female, 8,673); schoolhouses, number 10,000, value \$15,993,445; income, permanent funds \$838,339, taxation \$5,420,672, other \$66,364, total \$6,325,375; expenditures, for sites, buildings, and furnishings, \$598,825, salaries \$4,063,616; other \$1,020,504, total \$5,682,945, or \$13.32 per pupil. Of high schools M. had 158, with 499 teachers (262 male and 237 female), secondary pupils 13,301 (male 5,113, female 8,188), pupils below secondary grade 59,864 (28,666 males, 31,198 females). For the training of teachers there were the M. state normal schools at Kirksville (1st dist.), 490 students, Warrensburg

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(2d dist.), 649 students, and Cape Girardeau (3d dist.), 279 students; a normal dept. in Lincoln Institute, at Jefferson City, with 36 students; and the St. Louis Normal School, with 150 students. These schools combined had 28 male and 26 female instructors, 5,300 vols. in the libraries, scientific apparatus valued at \$5,150, grounds and buildings valued at \$575,000, and public income \$55,893. The institutions for the superior instruction of women (13) were: Christian Female College (Christian), Columbia; Stephens Female College (non-sect.), Columbia; Howard Female College (Meth. Episc.), Fayette; Fulton Synodical Female College (Presb.), Fulton; Kansas City Ladies' College (Presb.), Independence; Woodland College (Christian), Independence; St. Louis Seminary (non-sect.), Jennings; Bapt. Female College, Lexington; Central Female College (non-sect.), Lexington; The Elizabeth Aull Female Seminary (Presb.), Lexington; Hardin College (Bapt.), Mexico; Lindenwood Female College (Presb.), St. Charles; Mary Institute, Washington Univ. (non-sect.), St. Louis; and Ursuline Acad. (Rom. Cath.), St. Louis. These combined had 43 male and 122 female instructors, 1,467 students, 9,250 vols. in the libraries, scientific apparatus valued at \$4,500, and grounds and buildings valued at \$520,000.

The colleges of liberal arts (19) were: Southwest Bapt. College, Bolivar, chartered 1879 (Bapt.), Julius M. Leavitt, PH.D., pres.; Pike County College, Bowling Green, 1887 (non-sect.), Ernest W. Dow, pres.; Christian Univ., Canton, 1852 (Christian), Thomas F. Campbell, pres.; St. Vincent's College, Cape Girardeau, 1843 (Rom. Cath.), Rev. P. V. Byrne, pres.; Univ. of the State of M. (see below); Grand River College, Edinburg, 1876 (Bapt.), the Rev. J. T. Williams, D.D., pres.; Central College, Fayette, 1855 (Meth. Episc., South), O. H. P. Corprew, chairman faculty; Westminster College, Fulton, 1853 (Presb.), the Rev. William H. Marquess, pres.; Lewis College, Glasgow, 1867 (Meth. Episc.), the Rev. M. L. Curl, D.D., pres.; Pritchett School Institute, Glasgow, 1868 (non-sect.), J. S. Kendall, pres.; La Grange College, La Grange, 1859 (Bapt.), J. F. Cook, LL.D., pres.; William Jewell College, Liberty, 1849 (Bapt.), James G. Clark, LL.D., chairman faculty; Morrisville College, Morrisville, 1872 (Meth. Episc., South), the Rev. J. B. Ellis, pres.; College of the Christian Brothers, St. Louis, 1855 (Rom. Cath.), the Rev. Bro. Paulian, pres.; St. Louis Univ., St. Louis, 1832 (Rom. Cath.), the Rev. Henry Moeller, pres.; Washington Univ., St. Louis, 1853 (non-sect.), M. S. Snow, act'g chancellor; Drury College, Springfield, 1873 (Congl.), Francis T. Ingalls, pres.; Tarkio College, Tarkio, 1885 (Unit. Presb.), the Rev. J. A. Thompson, pres.; Central Wesleyan College, Warrenton, 1864 (Meth. Episc.), the Rev. Herman A. Koch, D.D., president; Central Christian College, Albany, 1892 (Christian); Northwest Missouri College, 1891 (Meth. Episc. South); Lawson Presbyterian College, Lawson, 1891 (Pres.); Searritt Collegiate Institute, Neosho, 1889 (Meth. Episc. South). The University of the State of M. at Columbia opened in 1841. In 1895 it had

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59 instructors (54 male and 5 female); of these 41 were in the college department and 18 in the professional department; of students the total was 614 (498 males and 116 females), in the collegiate department 318 (256 male and 62 female) graduate department 25 (20 male, 5 female), professional 135 (male). It has 6 fellowships; value of scientific apparatus \$100,800, grounds and buildings \$1,000,000, productive funds \$1,200,000; income, from productive funds \$76,855, state appropriations \$18,495; U. S. appropriations \$13,916, tuition fees \$13,034, other sources \$6,400, total \$148,700, volumes in library 15,000 books, 100,000 pamphlets. Washington Univ., at St. Louis, chartered 1853, provides the whole range of univ. studies excepting theol., and includes the college of arts, polytechnic school (with courses in civil engineering, dynamic engineering, chemistry, and mining and metallurgy), Henry Shaw School of Botany (established 1885), the St. Louis School of Fine Arts, and a law school opened 1866. The univ. had scientific apparatus valued at \$160,000, grounds and buildings valued at \$625,000, productive funds \$650,000, and income, excepting board and lodging, \$85,000.

In 1895 M. had among its charitable schools the following: School for the Deaf and Dumb, Fulton, instructors 24 (12 male, 12 female), pupils 310 (182 male, 128 female), value of grounds and buildings \$301,000, scientific apparatus \$1,000, expenditures \$58,225, volumes in library 2,000; Maria Consila School for the Deaf (private), St. Louis, 7 instructors, 44 pupils (8 males, 36 females); Missouri School for the Blind, St. Louis, 13 instructors, 116 pupils, value of grounds and buildings \$200,000, apparatus, \$350, expenditures \$28,000, volumes in library 4,000. The reform schools were: Missouri State Reform School for Boys, Booneville, 185 inmates, value of grounds and buildings \$75,000, expenditures \$32,300; State Industrial Home for Girls, Chillicothe, 72 inmates, value of grounds and buildings \$50,000, expenditures \$11,691; House of Refuge, St. Louis, 290 inmates (205 male, 85 female), value of grounds and buildings \$200,000, expenditures \$40,000.

Illiteracy.—Persons 10 years of age and over enumerated (1890) 1,995,638, of whom 181,368, or 9.09 per cent., were illiterates; male population 10 years of age and over 1,037,994, illiterates 86,530, or 8.3 per cent.; female population 10 years of age and upwards 957,644, illiterates 94,838, or 9.9 per cent.; total white population 10 years of age and over 1,881,478, illiterates 133,806, or 7.1 per cent.; native white population 10 years of age and over 1,651,622, illiterates 112,938, or 6.8 per cent.; foreign white population 10 years of age and over 229,856, illiterates 20,868, or 9.1 per cent.; colored population 10 years of age and over 114,160, illiterates 47,562, or 41.7 per cent.

Finances and Banking.—In 1890 the assessed value of all taxable property was \$387,975,928; true value \$2,397,902,945, of which \$1,438,731,201 was real estate. The *ad valorem* taxation was \$16,447,206, or \$6.14 per capita and

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\$1.85 per \$100 of assessed valuation. The total debt less sinking fund was \$51,557,568, or \$19.24 per capita; of this \$11,759,832 was state, \$10,240,082 county, \$28,092,103 municipal, and \$1,465,551 school district; annual interest \$2,488,276, or 5.2 per cent. On Jan. 1, 1897, the state bonded debt was \$5,000,000, all at 3½ per cent., school and seminary funds \$4,369,839. In 1902 the assessed val. was \$1,046,469,144, tax rate \$2.50 per \$1,000. On Oct 31, 1902, M. had in operation 78 national banks, capital \$21,609,980, U. S. bonds on deposit \$16,696,040, circulation outstanding \$19,040,508.

History.—The early history of M. is identical with that of La. (q.v.), of which territory it formed a part till 1812, when, La. being admitted as a state, the remainder of the tract was erected into the Terr. of M. Prior to this event, portions of the present state had become important and well known. Some of its lead mines were worked as early as 1720; and between that date and 1760, St. Louis, Cape Girardeau, and St. Genevieve were settled, the first as a fur-trading station. In 1775 St. Louis had pop. of about 800, and 1780 was attacked by a body of English soldiers and Indian allies from Michilimackinac, and was saved only by the timely arrival of Gen. Clarke, who hastened from Ill. at the call for aid. After the separation of La., M. gained rapidly in population by immigration from the e., the accessions more than doubling 1810–17, and St. Louis showing a pop. of 5,000. In 1817 the first steps were taken to secure admission into the Union. The petition of the terr. legislature to congress, for permission to prepare a state constitution, led to a bitter struggle in congress and to a general political excitement. The question at issue was whether M. should be admitted as a slave or a free state. A bill was introduced into congress in the session 1818–9 providing that the terr. should be admitted as a free state. This bill was strenuously opposed by the southern members, who were anxious that slavery should be legalized in the new state. The first constitution prepared forbade the legislature to pass emancipation laws without consent of owners, or to prevent immigrants from bringing slaves into the state with them, and directed it to prevent free negroes and mulattoes from coming to and settling in the state under any pretext. Chiefly through the influence of Henry Clay (q.v.), a compromise was effected, by which M. was to be admitted as a slave state, on condition that from all the terr. w. of M., and n. of the parallel of 36° 30' (the s. boundary of the new state), slavery should be excluded forever. This compromise allayed the excitement somewhat, but the 'free negro' clause in the proposed constitution revived it. The bill for admission passed the senate, but in the house a proviso was added that the state should abolish slavery, to which the senate disagreed. 1821, Mar. 2, another compromise was adopted, by which M. was to be admitted on the condition that the legislature should pledge the faith of the

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state that the 'free negro' clause should never be executed. June 26 following, the legislature passed a public and 'irrevocable' act in the terms required, though it declared in a preamble that the act was merely one of policy, to secure speedy admission, that the requirement of congress was unconstitutional, and that the people of the state did not intend to respect the condition so imposed. The compromise agreement was observed till virtually repealed by the bills which established the territories of Kan. and Neb. 1854; and M. was admitted by presidential proclamation 1821, Aug. 10. Excepting the part taken by some of its citizens in the Kansas (q.v.) troubles 1854-59, the history of the state was that of general prosperity till the beginning of the civil war. 1861, Jan. 16, the state senate adopted a bill providing for a convention to determine the position of the state on the question of secession. This body met in Jefferson City Feb. 28, and in St. Louis Mar. 4. The dominant feeling in the state, the legislature, and the convention, was in favor of the Union; and nothing occurred to indicate opposition to the prosecution of the war till June 12, when, in consequence of a difficulty between the federal troops sent to St. Louis, as an important military point, and the state militia, Gov. Jackson called out 50,000 state militia to 'repel invasion,' and removed with other state officers from Jefferson City to Boonville. Two days later, the federal troops, under Gen. Nathaniel Lyon (q.v.), attacked the state militia at Jefferson City and defeated them. On July 30 the convention declared the legislature dissolved, and chose a new gov. (Gamble), lieut. gov., and sec. of state. Gov. Jackson immediately issued another proclamation, in which he declared M. to be out of the Union. More federal and some Confederate troops were at once thrown into M.; Gen. Lyon was killed in the battle of Wilson's Creek, near Springfield, Aug. 10; Gen. Fremont declared martial law Aug. 21; and a large Confederate force, under Gen. Sterling Price, captured Lexington Sep. 20. Fremont advanced into the s.w., having several skirmishes on the way, and was succeeded by Gen. Hunter Nov. 2, and he by Gen. Halleck, as commander of the w. dept., Nov. 18. About this time nearly half the state was held by the Confederates, and an attempt was made, by some members of the old legislature, to force the state into the Confederacy. In 1862, Feb., the Confederates under Gen. Price were driven into Ark. by federal troops under Gen. Curtis; and during 1862 and 3 the state was disturbed by guerilla warfare, mainly on the s. border. The convention of 1861, kept alive by adjournments, passed an ordinance 1863 providing for the emancipation of all slaves in the state in 1870. Late in 1864, Gen. Price again invaded M. and made a raid diagonally from s.e. to n.w., but was ultimately forced to retreat into w. Ark. In 1864, Nov., a state election was held, the state having been governed since 1861, July, by officers elected by the convention. 1865, Jan. 6, a convention assembled in St. Louis and framed a new constitution, which was adopted

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by the people June following; 1869 the last of the amendments (15th) to the federal constitution was ratified by the legislature; and 1875, Oct. 30, the present state constitution was adopted. During the civil war, M. furnished 109,111 men to the federal armies.

Government.—The executive authority is vested by the constitution (1875) in a gov. elected for 4 years, salary \$5,000 per annum; the legislative in a general assembly, comprising (1890) a senate of 34 members elected for 4 years, and a house of representatives of 140 members elected for two years, salary of each \$5 per day and mileage, sessions biennial, limit of sessions 70 days; and the judicial in a supreme court, comprising 5 judges elected by the people for 10 years, one being elected every 2 years, and the oldest in commission being chief-justice, salary of chief-justice \$4,500 per annum; in a circuit court in each judicial circuit, as created by the legislature, with one judge in each; in co. and probate courts, with one judge for each; municipal corporation courts; special circuit, criminal, and criminal correction courts in the city of St. Louis (which is a distinct political subdivision of the state); and the usual justices of the peace. The lieut. gov. receives \$7 per day during the session of the general assembly; sec. of state \$3,000 per annum; treas. \$3,000; auditor \$3,000; atty. gen. \$3,000; adjt. gen. \$2,000; supt. public schools \$3,000; register of lands \$3,000; 3 railroad commissioners \$3,000; supt. insurance dept. \$4,000; 2 U. S. district judges \$3,500 each; 5 collectors of internal revenue \$2,250—\$4,500 each; and U. S. surveyor of customs (St. Louis) \$5,000. The legal rate of interest is 6 per cent.; by contract 10; usury forfeits entire interest. Adultery, wilful desertion for 1 year, habitual drunkenness, cruel and abusive treatment, imprisonment for or conviction of felony, and ungovernable temper, are among the chief grounds of divorce.

The successive govts., with their terms of service, are as follows: Alexander McNair 1820–24; Frederick Bates 1824–26; John Miller 1826–32; Daniel Dunklin 1832–36; Lilburn N. Boggs 1836–40; Thomas Reynolds 1840–44; John C. Edwards 1844–48; Austin A. King 1848–53; Sterling Price 1853–57; Trusten Polk 1857; H. Johnson (act'g) 1857; R. M. Stewart 1857–61, Claiborne F. Jackson 1861; Hamilton R. Gamble 1861–64; Thomas C. Fletcher 1865–69; Joseph W. McClurg 1869–71; Benjamin Gratz Brown 1871–73; Silas Woodson 1873–75; Charles H. Hardin 1875–77; John S. Phelps 1877–81; Thomas T. Crittenden 1881–85; John S. Marmaduke 1885–87; Allen G. Morehouse 1887–89; David R. Francis 1889–93; William J. Stone 1893–97; L. V. Stephens 1897.

Counties, Cities, and Towns.—M. is divided into 115 counties. In 1880 the most populous *counties* were: St. Louis (city and co. co-extensive) 350,518; Jackson 82,325; Buchanan 49,792; Jasper 32,172; Saline 29,911; Nodaway 29,544; Greene 28,801; Johnson 28,172; Pettis 27,271; Pike 26,715; and Franklin 26,534; *cities and towns*: Kansas City 55,785; St. Joseph 22,431; Hannibal 11,074;

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Joplin 7,038; Springfield 6,522; Moberly 6,070; Jefferson 5,271; and St. Charles 5,014. In 1890 the leading *counties* were: St. Louis 451,770; Jackson 160,510; Buchanan 70,100; Jasper 50,500; Greene 48,613; Saline 33,762; Pettis 31,151; Lafayette 30,184; Pike 26,321; and Chariton 26,254; *cities and towns*: Kansas City 132,716 (including 13,048 in suburbs since declared illegally annexed); St. Joseph 52,324; Springfield 21,850; Hannibal 12,857; Joplin 9,943; Moberly 8,215; Carthage 7,981; and Jefferson 6,742.

Politics.—State, congressional, and presidential elections are held Tuesday after first Monday in Nov. Officers and men in the U. S. army, and inmates of asylums, poor-houses, and prisons, are excluded from voting. The state govt. (1903) was democrat, with a party maj. of 18 in the sen., 22 in the house, 40 on joint ballot. M. has 18 electoral votes. Her votes for pres. and vice-pres. have been as follows: 1824, Henry Clay and Andrew Jackson 3; 1828, Andrew Jackson and John C. Calhoun; 1832, Andrew Jackson and Martin Van Buren 4; 1836, Martin Van Buren and Richard M. Johnson; 1840, Martin Van Buren and Richard M. Johnson; 1844, James K. Polk and George M. Dallas 7; 1848, Lewis Cass and William O. Butler; 1852, Franklin Pierce and William R. King 9; 1856, James Buchanan and John C. Breckinridge; 1860, Stephen A. Douglas and Herschel V. Johnson; 1864, Abraham Lincoln and Andrew Johnson 11; 1868, U. S. Grant and Schuyler Colfax; 1872, Thomas A. Hendricks 6, B. Gratz Brown 8, and David Davis 1, for pres., and B. Gratz Brown 6, George W. Julian 5, J. M. Palmer 3, and William S. Groesbeck 1, for vice-pres.; 1876, Samuel J. Tilden and Thomas A. Hendricks 15; 1880, Winfield S. Hancock and William H. English; 1884, Grover Cleveland and Thomas A. Hendricks 16; 1888, Grover Cleveland and Allen G. Thurman 16; 1892, Grover Cleveland and Adlai E. Stevenson 17; 1896, William J. Bryan and Arthur Sewall 17; 1900, William J. Bryan and Adlai E. Stevenson.

Population.—(1810) white 17,227, free colored 607, slaves 3,011, total 20,845; (1820) white 55,988, free colored 376, slaves 10,222, total 66,586; (1830) white 114,795, free colored 569, slaves 25,091, total 140,455; (1840) white 323,888, free colored 1,574, slaves 58,240, total 383,702; (1850) white 592,004, free colored 2,618, slaves 87,422, total 682,044; (1860) white 1,063,489, free colored 3,572, slaves 114,931, total 1,182,012; (1870) white 1,603,146, colored 118,071, total 1,721,295; (1880) white 2,022,826, colored 145,554, total 2,168,380; (1890) 2,679,184; (1900) 3,106,665.

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MISSOURI RIVER: the great head stream which forms, by union with the upper Mississippi river and the Ohio river, the trunk river bearing the name Mississippi (q.v.). The name M. signifies Mud river, and the character of the water known for more than 1,200 m. of the Mississippi, from the Gulf of Mexico, is given by the M. Below the confluence of the two streams, 16 m. above St. Louis, the separate volumes of the upper Mississippi and the M. flow side by side for a long distance without mingling, and it is plain to the eye which is the great river and which will be lost in the other. The lower reach of the M. is of about 400 m. across the state of Mo., in a generally e. direction. From Kansas City n. it is the w. boundary of the state, and beyond the n.w. corner of Mo. the ascent of the stream leads past Omaha to Sioux City, 824 m. from its mouth, and thence n.w. and n. across S. Dak. and more than half of N. Dak. From this point the line of the stream is generally e. and w., past the mouth of the Yellowstone, a great navigable tributary, and far on to the foot-hills of the Rocky Mts., where the Great Falls occur, a succession of four within $16\frac{1}{2}$ m.; the successive perpendicular rises being 87 ft., 19 ft., 47 ft., and 26 ft. The rapids connecting the cataracts increase the whole rise to 357 ft. The ascending course of the stream penetrates the Rocky Mts. 145 m. further on, by a narrow gorge, $5\frac{3}{4}$ m. long, 450 ft. wide, and with walls of rock rising perpendicularly 1,200 ft. directly from the water. The source is 400 m. beyond these 'Gates of the Rocky Mts.,' in the confluence of two small streams, the Jefferson and Wisdom, of which the latter rises within a mile of the head springs of Clarke's fork of the Columbia. The stream thus formed is joined 80 m. down by the Gallatin and Madison, and this confluence of three rivers is by some regarded as the starting-point of the M. The higher point is at the boundary between Mont. and Ida., lat. $45^{\circ} 15' \text{ n.}$, and long. $110^{\circ} 30' \text{ w.}$; and for nearly 2,000 m., descending the river, the course is through Mont., N. Dak., and S. Dak., after which it has Io. and the n. part of Mo. on its left bank, and Neb. and Kan. on its right, until, at Kansas City, it passes into and across Mo., to its mouth, 2,908 m. from the lower source, or 2,988 from the highest, and 1,286 m. from the fall of its muddy waters into the Gulf of Mexico. The width of the M. is 1,500 ft. at Fort Benton, 2,500 ft. at Sioux City, and 3,000 ft. from St. Joseph to its mouth. The highest source is not far from 7,900 ft. above sea-level; that at Fort Benton 2,845 ft.; at Sioux City 1,065 ft.; at St. Joseph 756 ft.; and at its mouth 381 ft. The mouth of the M. is 159 m. above the passage of the trunk river into the head of the Mississippi alluvial basin, and 189 m. above the mouth of the Ohio. Navigation on the M. is regular to the mouth of the Yellowstone, on the border of N. Dak. and Mont., and it may extend as far as the Great Falls. The Yellowstone, a navigable river for about 300 m., is the largest tributary of the M., and

MISSOURI COMPROMISE—MISSTATE.

lower down other tributaries on the right are the Little Missouri, Big Cheyenne, White Earth, Niobrara, Platte or Nebraska, Kansas, and Osage. On the left it receives the Milk, Dakota, Big Sioux, and Little Sioux. All the great streams which rise on the e. side of the Rocky Mts., except the Arkansas, thus send their waters into the M., which, with its large share of the streams between it and the upper Mississippi, drains an area of 518,000 sq. m. Some idea of the value of the M. to inland commerce is given in the fact that great numbers of steamers ply on its upper waters even, and on the Yellowstone, where a single tug may conduct a fleet of barges equal to 500 r.r. cars; and a steamer has been known to descend to New Orleans with barges carrying 600,000 bush. of coal, equal to 1,800 car-loads. The upper course of the M. is through a dry and open country, where at certain seasons the rapid evaporation of the water leaves portions of the stream shallow. The elevation of the sources is about 7,500 ft. above sea-level; that of the stream at the mouth of the Yellowstone is 2,010 ft.; and the general flow of the water is rapid. On the lower course of the river its channel is cut through a rich alluvial valley, back of which, on either side, lie extensive prairies. At its mouth the M. is over half a m. wide, and in many places higher up the width is much greater. The chief points of commerce reached in ascending the M. are St. Charles, Jefferson City, Boonville, and Lexington, in crossing the state of Mo.; then Kansas City; St. Joseph, Mo.; Omaha, Neb.; Council Bluffs and Sioux City, Io.; Yankton and Pierre, S. Dak.; Bismarck, N. Dak.; and Fort Benton, Montana.

MISSOURI COMPROMISE: see MISSOURI.

MISSPEAK, v. *mīs-spēk'* [*mis*, wrong, and *speak*]: in *O.E.*, to blunder in speaking.

MISSPELL, or MISSPEL, v. *mīs-spēl'* [*mis*, wrong, and *spell*]: to write with wrong letters; to spell wrongly. MISSPELL'ING, imp.: N: a wrong spelling. MISSPELLED', pp. *-spēld'*, or MISSPELT', pp. *-spēlt'*: ADJ. wrongly spelt.

MISSPEND, v. *mīs-spēnd'* [*mis*, wrong, and *spend*]: to waste and consume to no purpose; to spend badly. MISSPEND'ING, imp. MISSPENT', pt. *-spēnt*: ADJ. wasted; consumed to no purpose.

MISSTATE, v. *mīs-stāt'* [*mis*, wrong, and *state*]: to state wrongly; to represent falsely. MISSTA'TING, imp. MISSTA'TED, pp. MISSTATE'MENT, n. *-mēnt*, an erroneous representation, whether verbal or written.

MISSY: see *Miss* 1.

MIST—MISTAKE.

MIST, n. *mǐst* [Icel. *mistr*, a foggy darkness in the air: Dut. *miest* and *mist*, mist; *mieselen*, to exhale a mist, to rain fine: Ger. *mist*, dung, mist]: the vapor of water hanging over sea or land, less dense than a fog (q.v.); vapor floating and falling in fine particles in the form of very small rain; that which dims or obscures, or intercepts vision, as if it were a vapor or a mist: V. in *OE.*, to cover with vapor; to cloud. **MIST-LIKE**, having the appearance of mist; misty. **MISTY**, *mǐst'ĩ*, a. overspread with mist; dim or obscure. **MIST'FUL**, a. *-fûl*, clouded with mist. **MIST'ILY**, ad. *-ĩ-lĩ*, darkly; obscurely. **MIST'-INESS**, n. *-ĩ-nēs*, state of being misty; obscurity.

MISTA'EN, pp. *mīs-tān'*: a poetic spelling for **MISTAKEN**.

MISTAKE, v. *mīs-tāk'* [*mīs*, wrong, and *take*: Icel. *mistaka*, to take by mistake—from *taka*, to take]: to misunderstand; to conceive wrongly; to take one person or thing for another; to err in opinion or judgment: N. an error of any kind; a misconception; a blunder; an oversight. **MISTA'KING**, imp.: N. in *OE.*, an error. **MISTA'KEN**, pp. *-tā'kn*, wrong or in error, as applied to persons (this application to *persons* is a popular usage, but of doubtful propriety): misunderstood, as applied to things: **ADJ.** erroneous; wrongly judging; incorrect. **MISTOOK**, pt. *mīs-tūk'*, did mistake. **MISTAKABLE**, a. *mīs-tā'kǎ-bl*, that may be mistaken. **MISTA'KENLY**, ad. *-lĩ*. **MISTA'KINGLY**, ad. *-lĩ*. **BY MISTAKE**, under error or misapprehension; unintentionally. **No MISTAKE**, *familiarly*, without fail; without possible error; with certainty. **To BE MISTAKEN**, properly, to be taken wrongly, i.e., to be misunderstood; also popularly, but with doubtful propriety, to misunderstand, to commit an error of judgment; to be deceived.

MISTAKE', in Law: an error which may be due to ignorance, forgetfulness, carelessness, undue confidence in another, etc., which leads to the omission of something which should have been performed, or to the commission of an act which would not otherwise have been done. There are two classes of mistakes; those of law, and those of fact, which are very differently treated. The great principle that ignorance of the law is no excuse for wrong-doing is maintained in courts both of law and of equity. If this were abandoned many people would prefer to remain ignorant of matters concerning which they should be informed. If the M. is purely legal the law must take its course, even though the results of an act are radically different from those anticipated. But when there are such causes for the M. as incapacity, fraud, undue influence, or imposition, a court of equity may set aside the contract. When there is no fraud, either of act or of intent, but an error is held in common by both parties to a transaction, a compromise will usually be sustained by the court. The same is true of compromises of contested claims to estates. A M. in regard to the law of a foreign country is subject

to rectification on the ground that it is not obligatory on a resident of one country to study the laws of another. And a M. in law may be accepted as an excuse when a man has promised to perform a certain act because he supposed that it was obligatory on him to do so when no such claim existed. Mistakes of fact are much more readily corrected than are those of law. When an error shared by both parties is committed in ignorance of some important fact bearing on the case, relief can usually be secured through the courts, even though no fraud or deception has been attempted; but the facts must be of such importance as to exercise a determining influence on the transaction. The M. may be rectified by a return of the property to the former owner, or when that is impossible, by an imposition of money damages for any deficiency which may be found to exist. When the M. is on only one side, and there has been no fraud, legal relief cannot usually be secured. The means of information being open to both parties, each is supposed to look after his own interests. But where a party having apparent reason to do so, reposes confidence in another and is misled by the concealment of some important fact, he may be able to obtain redress from the courts of equity. Legal instruments, agreements, etc., which contain material errors and fail to set forth the intention of the parties may be corrected by order of the court, but this does not apply to a M. of law in which the language of the contract carries a different meaning from what the parties accepting it expected.

MISTASSINI, *mīs-tās-sē'nē*, LAKE: large lake in the s. part of N. E. Territory, Canada. The Territory extends from the n. side of the province of Quebec up the whole e. side of Hudson's Bay; and the lake is the head-water of Rupert's river, which flows w. into the s. arm of Hudson's Bay, James's Bay. The direction of the lake from Quebec is a little w. of n., and the situation is just beyond and close to, the Wotchish Mts., and directly opposite the head of an e. branch of the Saguenay river. Its dimensions are not accurately known; but it is probably about 100 m. long and 15 to 30 or 40 m. wide, but of irregular outline.

MISTAUGHT, v. *mīs-tawt'* [*mis*, wrong, and *taught*]: pt. and pp. of *misteach*; wrongly taught.

MISTEACH, v. *mīs-tēck'* [*mis*, wrong, and *teach*]: to instruct wrongly. MISTEACH'ING, imp. MISTAUGHT', pt. and pp., which see.

MISTER, n. *mīs'tēr* [a misspelling of *master*—from L. *magister*, a master]: a common title of address to any adult male, contracted into Mr.

MISTER: for MYSTER, trade; craft: see MYSTER.

MISTERM, v. *mīs-tērm'* [*mis*, wrong, and *term*]: to name erroneously.

MISTHINK—MISTLETOE.

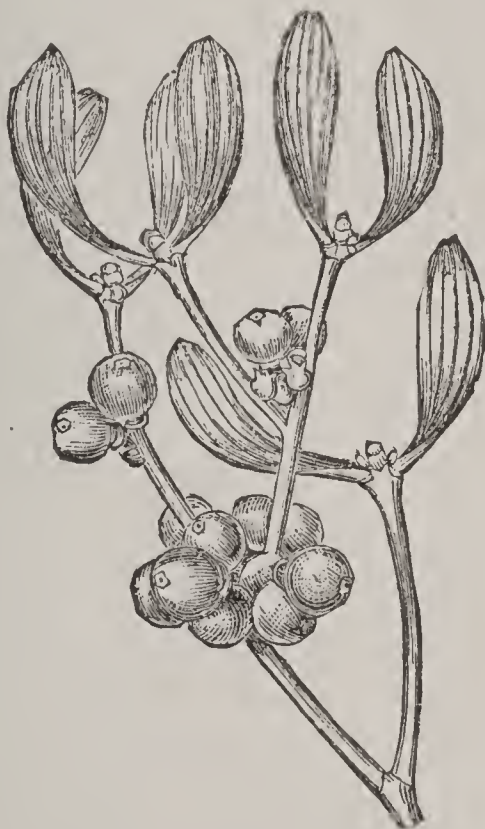
MISTHINK, v. *mĭs-thĭngk'* [*mis*, wrong, and *think*]: in *OE.*, to think ill or wrongly. **MISTHOUGHT'**, n. *-thawt'*, a false opinion; a wrong thought.

MISTILY, **MISTINESS**: see under **MIST**.

MISTIME, v. *mĭs-tĭm'* [*mis*, wrong, and *time*]: to arrange ill as to time; not to adapt to the time. **MISTI'MING**, imp.: N. the doing at a wrong time, or unseasonably. **MISTIMED'**, pp. *-tĭmd'*: **ADJ.** done out of season or at a wrong time.

MISTITLE, v. *mĭs-tĭ'tl* [*mis*, wrong, and *title*]: to designate by a wrong title or name. **MISTI'TLING**, imp. *-tĭ'tling*. **MISTI'TLED**, pp. *-tĭ'tld*.

MISTLETOE, or **MISLETOE**, or **MISSSELTOE**, n. *mĭz'l-tō* [*Icel. mistelteinn*; *AS. misteltan*; *Dut. and Ger. mistel*, the mistletoe—the latter part is the *Icel. teinn*, a prong of metal: *Norw. tein*; *Goth. tains*, the shoot of a tree, a twig]: genus (*Viscum*) of small parasitical evergreen shrubs of nat. order *Loranthaceæ*. This order is exogenous, and contains more than 400 known species, mostly tropical and parasites. The leaves are entire, almost nerveless, thick and fleshy, and without stipules. The flowers of many species are showy. The calyx arises



Mistletoe (*Viscum album*).

from a tube or rim, which sometimes assumes the appearance of a calyx, and is so regarded by many botanists; what others deem the colored calyx being viewed by them as a corolla of 4 or 8 petals or segments. Within this are the stamens, as numerous as its divisions, and opposite to them. The ovary is one-celled, with a solitary ovule; the fruit one-seeded, generally succulent.—**COMMON M.**

MISTOOK.

(*V. edum*) is a native of Britain and of the greater part of Europe, forming a bush about 4 ft. long, growing on many kinds of trees, particularly on the apple, and others botanically allied to it, as the pear, service, and hawthorn; sometimes, also, on sycamores, limes, poplars, locust-trees, and firs, but very rarely on oaks (contrary to the common belief). It is very plentiful in some parts of s. England, its evergreen leaves giving a peculiar appearance to the orchards in winter, when the bushes of *M.* are very conspicuous among the naked branches of the trees; but it is very local. The stems are *dichotomous* (i.e., divide by forking); the leaves are opposite, of yellowish-green color, obovate-lanceolate, obtuse. The flowers are inconspicuous, and grow in small heads at the ends and in the divisions of the branches, the male and female flowers on separate plants. The berries are about the size of currants, white, translucent, and full of a very viscid juice, which serves to attach the seeds to branches, where they take root when they germinate, the radicle always turning toward the branch, whether on its upper or under side. The *M.* derives its nourishment from the living tissue of the tree on which it grows, and from which it seems to spring as if it were one of its own branches. The berries are a favorite food of thrushes; and it has been supposed that the *M.* was propagated by the seeds deposited from the birds; the propagation is really by the wiping off of the seeds from the bird's beak which it rubs against the bark. Bird-lime is made from the seeds and bark. The *M.* was intimately connected with many superstitions of the ancient Germans and of the British Druids. In the northern mythology, Balder is said to have been slain with a spear of mistletoe. Among the Celts, the *M.* which grew on the oak was in peculiar esteem for magical virtues. Traces of the ancient regard for the *M.* remain in some old English and German customs, as kissing under the *M.* at Christmas. The *M.* was at one time in high repute as a remedy for epilepsy and convulsions, but it seems to possess no decided medicinal properties.—*Loranthus Europæus*, a shrub very similar to the *M.*, but with flowers in racemes, is plentiful in parts of s. Europe, and very frequently grows on oaks.—*L. odoratus*, Nepaulese species, has very fragrant flowers.—*American Mistletoe* (*Phoradendron flavescens*) differs little from the European, and was formerly included in the same genus. It has a globular calyx, 3 (rarely 2-4) lobed; and is found on deciduous trees from N. J. to Ill. and southward. *Note*.—*Mistel*, the 'mistletoe,' is a dim. of Ger. *mist*, dung—probably in reference to the seeds deposited by the birds who eat the berries, or it may refer to the slime of the berries: O. Dut. *mistel*, bird-lime—see Skeat.

MISTOOK: pt. of MISTAKE, which see.

MISTRAL—MISTRESS.

MISTRAL, n. *mĭs'trāl*, or **MISTRAON**, or **MAESTRAL** [F. *mistral*; OF. *maestral*, the mistral—from It. *maestrale*—from mid. L. *magistrālis*—*lit.*, the masterful wind]: Provencal designation of the *Caurus* or *Corus* of the Romans; a n.w. wind which at certain seasons of the year prevails on the s. coast of France. Its approach is heralded by a sudden change of the temperature, from genial warmth to piercing cold; the air is felt to be purer, and more easily inhaled, the azure of the sky is undimmed by cloud, and the stars shine by night with extraordinary and sparkling brightness; this last appearance is an infallible prognostic. The M. then comes in sudden gusts, struggling with the local aerial currents, but its fast increasing violence soon overcomes all opposition. In a few hours, it has dried up the soil, dispersed the vapors of the atmosphere, and raised a dangerous tumult among the waters of the Mediterranean. The M. blows with its greatest force from the end of autumn to the beginning of spring, and causes much damage to the fruit-trees in blossom, and often to the field-crops. It is a terror to the mariners of the gulfs of Lyon and Valence, and even the most hardy seaman makes all haste to a harbor of refuge. The most probable cause of the M. is the derangement of atmospheric equilibrium produced by the cold condensed air of the Alps and Cevennes rushing in to supply the vacuum produced by the expansion of the air in the warm s. provinces of France, and on the surface of the Mediterranean. This wind is appropriately denominated by the Italians *Maestro*.

MISTRANSLATE, v. *mĭs'trans-lāt'* [*mis*, wrong, and *translate*]: to translate erroneously. **MIS'TRANSLA'TING**, imp. **MIS'TRANSLA'TED**, pp. **MIS'TRANSLA'TION**, n. *-lā'shūn*, an erroneous version or translation.

MISTREADING, n. *mĭs-trēd'ing* [*mis*, wrong, and *tread*]: in *OE.*, a false step; the choosing of a wrong path.

MISTREAT, v. *mĭs-trēt'* [*mis*, wrong, and *treat*]: to ill-treat; to abuse. **MISTREAT'ING**, imp. **MISTREAT'ED**, pp. **MISTREAT'MENT**, n. *-mēnt*, ill treatment·abuse.

MISTRESS, n. *mĭs'trēs* [OF. *maïstressē*; F. *maîtresse*, fem. of *maître*, master: L. *magistra*, a mistress]: the fem. of *master*; a woman who instructs or governs a school: a female teacher; a woman who governs or holds authority; a woman beloved and courted; a term of address applied to a married untitled woman, now contracted into and written Mrs; the female head of a family; a concubine; a woman who holds something in possession, a woman who has skill in something. **MISTRESS OF THE WORLD**, a name of Old Rome, in respect of the wide and far-reaching extent of her dominions and power. **MISTRESS OF THE ROBES**, a post in the queen's household, held by a lady of high rank, but its duties may often be performed by deputy—so named from having charge of the queen's robes.

MISTRETТА—MISY.

MISTRETТА, *mĭs-trĕt'ĭtā*: town of the island of Sicily, 67 m. w.s.w. of Messina; cap. of a district. It occupies a healthful situation near the n. coast, in the vicinity of the river Nebroden. Pop. (1881) 13,132.

MISTRUST, n. *mĭs-trŭst'* [*mis*, wrong, and *trust*]: want of confidence or trust; suspicion: V. to doubt; to suspect; to regard with suspicion. **MISTRUST'ING**, imp. **MISTRUST'ED**, pp. **MISTRUST'FUL**, a. *-fŭl*, suspicious; wanting confidence in. **MISTRUST'FULLY**, ad. *-lĭ*.

MISTUNE, v. *mĭs-tŭn'* [*mis*, wrong, and *tune*]: to tune wrongly; to put out of tune. **MISTU'NING**, imp. **MISTUNED'**, pp. *-tŭnd'*.

MISTY, **MISTILY**, **MISTINESS**: see under **Mistr**.

MISUNDERSTAND, v. *mĭs'ŭn-dĕr-stănd'* [*mis*, wrong, and *understand*]: to take in a wrong sense; to misconceive. **MIS'UNDERSTAND'ING**, imp.: N. a mistake of the meaning; an error; a softer name for a quarrel; disagreement; dissension or slight difference. **MIS'UNDERSTOOD'**, pt. and pp. *-stŭd'*, did take in a wrong sense; understood wrongly.

MISUSAGE, n. *mĭs-ŭ'zāj* [*mis*, wrong, and *usage*]: ill usage; abuse.

MISUSE, v. *mĭs-ŭz'* [*mis*, wrong, and *use*]: to treat or use improperly; to treat ill; to use to a bad purpose: N. *mĭs-ŭs'*, improper use; ill treatment; wrong application. **MISU'SING**, imp. *-zĭng*. **MISUSED**, pp. *mĭs-ŭzd'*.—**SYN.** of 'misuse, v.': to abuse; misapply; misemploy; maltreat.

MISWEEN, v. *mĭs-wĕn'* [*mis*, wrong, and *ween*]: in *OE.*, to misjudge; to mistrust.

MISWEND, v. *mĭs-wĕnd'* [*mis*, wrong, and *wend*]: in *OE.*, to go wrong.

MISY, n. *mĭ'sĭ* [a miner's name]: an impure sulphate of peroxide of iron, a mineral of a fine bright-yellow color, and of friable structure.

MITÂKSHARÂ: name of several commentatorial works in Sanskrit—e.g., of a commentary on the text-book of the Vedânta philosophy, of a commentary on the Mîmânsâ work of Kumârila, of a commentary on the Brîhadâran'yaka (see VEDA), etc. The most renowned work, however, bearing this title is a detailed commentary by Vijnânes'wara (called also Vijnânanâtha), on the law-book of Yâjñavalkya (q.v.); and its authority and influence are so great that 'it is received in all the schools of Hindu law from Benares to the s. extremity of the peninsula of India as the chief groundwork of the doctrines which they follow, and as an authority from which they rarely dissent' (cf. two treatises on the Hindu law of inheritance, translated by H. T. Colebrooke, Calcutta 1810). Most of the other renowned law-books of recent date, such as the Smr'iti-Chandrikâ, which prevails in s. India, the Chintâman'i, Viramitrodaya, and Mayûkha, which are authoritative severally in Mithilâ, Benares, and with the Mahrattas, generally defer to the decisions of the M.; the Dâyabhâga of Jimûtavâhana alone, which is adopted by the Bengal school, differs on almost every disputed point from the M., and does not acknowledge its authority. The M., following the arrangement of its text-work, the code of Yâjñavalkya, treats in its first part of duties in general; in its second, of private and administrative law; in its third, of purification, penance, devotion, etc.; but since it frequently quotes other legislators, expounding their texts, and contrasting them with those of Yâjñavalkya, it is not merely a commentary, but supplies the place of a regular digest. The text of the M. has been edited several times in India. An excellent translation of its chapter 'On Inheritance,' was published by Colebrooke in the work above referred to; and its explanation of Yâjñavalkya is followed by the same celebrated scholar in his *Digest of Hindu Law*.

MITAU: see MITTAU.

MITCHEL, *mîch'él*, JOHN: 1815, Nov. 3—1875, March 20: b. Dungiven, Ireland. He graduated, 1836, from Trinity College, and practiced law several years, meanwhile writing for the press. In 1845 he became editor of the *Dublin Nation* and about this time published the *Life of Hugh O'Neil*. In 1848 he left the *Nation* and established the *United Irishman*, which in about three months was suppressed on account of its violent revolutionary utterances, and M. was sentenced to transportation for 14 years. He was taken to Bermuda, and later to Australia. He escaped, 1853, to New York, where he established a pro-slavery paper and published his *Jail Journal*. He afterward published papers in Knoxville, Tenn., and Richmond, Va.; returned to Ireland 1874, and was elected to parliament, but was not allowed to serve. He was elected again but died at Cork before his case was decided. He edited the poems of Thomas Davis and James C. Mangan, wrote *The Last Conquest of Ireland—Perhaps*, and continued McGeoghegan's *History of Ireland*.

MITCHEL.

MITCHEL, ORMSBY MACKNIGHT, LL.D.: 1810, Aug. 28—1862, Oct. 30; b. Morganfield, Ky.: astronomer and soldier. His childhood was spent in Lebanon, O., where he gained a good knowledge of Greek, Latin, and mathematics. When 13 years of age he became clerk in a store at Miami, but later returned to Lebanon. In 1825, June, he entered West Point Milit. Acad., from which he graduated 1829. Among his classmates were Robert E. Lee and Joseph E. Johnston. For two years he was assistant prof. in the mathematical dept. of the institution and held the rank of 2d lieut. of artillery. In 1832 he was stationed at St. Augustine, Fla., but soon resigned. He studied law, was admitted to practice in Cincinnati, and also held the position of chief engineer of a railroad. In 1834 he was chosen prof. of mathematics, philosophy, and astronomy, in Cincinnati College, which position he held till 1844, when he was made director of a large observatory which had been created in Cincinnati mainly through his efforts, and in behalf of which he had delivered many lectures and made a trip to Europe. In 1859 he became director of the Dudley observatory, Albany, N. Y., for which he had drawn the plans; but he still retained his connection with the Cincinnati institution. He invented and perfected various astronomical instruments of great value, and made a large number of important observations. At the opening of the civil war he entered the army and 1861, Aug. 9, was appointed brig.gen. of Ohio vols. He fortified the city of Cincinnati, served in various southern states, and won fame in the great railroad raid of 1862 in n. Ala. He was, 1862, April 11, appointed maj.gen.; in Sep. of that year was assigned to the dept. of the south, and while actively arranging for the campaign was taken with yellow fever and died at Beaufort, S. C. The observatory which he founded at Cincinnati has been removed to Mount Look-out, has received his name, and is supported by the city. He was a most interesting and instructive popular lecturer on astronomy, and a member of scientific societies in this country and Europe. Gen. M.'s mind was singularly clear and penetrating, he was prompt and decisive in action, undismayed by any dangers or difficulties, and nobly devoted to high aims. He published, 1846-48, a paper devoted to astronomical matters, revised Burritt's *Geography of the Heavens*, and wrote *The Planetary and Stellar Worlds*; *The Orbs of Heaven*; *A Concise Elementary Treatise of the Sun, Planets, Satellites, and Comets*; and *The Astronomy of the Bible*. His life was published 1865, by the Rev. P. C. Headley, and by his son, Frederick A. Mitchel, 1887.

MITCHELL.

MITCHELL, DONALD GRANT, LL.D.: 1822, April 12, b. Norwich, Conn. He studied at Ellington (Conn.) Acad., and graduated from Yale 1841. For the next three years he worked on a farm for improvement of his health. He contributed articles to the *Albany Cultivator*, and drew a set of plans for farm buildings which won a silver medal from the N. Y. Agricultural Soc. He travelled in Europe 1844-46, and in 1847 published his first book, *Fresh Gleanings*. He studied law in New York, and, 1848, again went abroad; he was at Paris when the outbreak of that year occurred, and published his observations under the title *The Battle Summer*. *The Lorgnette* followed, 1850, and was soon succeeded by *Reveries of a Bachelor*, which was remarkably popular, and *Dream Life*, which won nearly equal fame. He was married, 1853, and immediately sailed to Venice, to which place he had been appointed U. S. consul. He published *Fudge Doings* 1854; and 1855 purchased Edgewood, a beautiful farm near New Haven, Conn., which has been made famous by his books on rural life, *My Farm of Edgewood* and *Wet Days at Edgewood*. Among his works are *Seren Stories*, *Doctor Johns*, *Rural Studies*, *Pictures of Edgewood*, *About Old Story-tellers*, *Out of Town Places*. At the Paris exposition, 1878, he was U. S. commissioner. He is a skilful landscape gardener, a member of the council of the art school, and prof. of belles-lettres, in Yale Univ. Several of his books have appeared under the authorship name 'Ik Marvel.'

MITCHELL, JOHN INSCHO: b. 1838, July 28, Tioga co., Penn. He attended the common schools, and when 18 years of age entered Lewisburg Univ., where he remained two years. After teaching school he became a student in a law office, but on the opening of the civil war he entered the Union army as 2d lieut. He was promoted capt. for bravery at Chancellorsville. After completing his studies he was admitted to the bar 1864, was dist. attorney 1868-71, in the latter year was elected to the Penn. house of representatives, and soon became leader of the republican side of the house. By successive re-elections he held this office till 1876, when he was elected representative to congress; he was re-elected 1878; declined re-nomination 1880. In 1881 he entered the U. S. senate for a term of six years.

MITCHELL.

MITCHELL, MARIA, PH.D., LL.D.: 1818, Aug. 1—1889, June 28; b. Nantucket, Mass.: astronomer. She was taught by her father, and in the school of Prof. Pierce in which she was also assistant teacher. When 18 years of age she became librarian of the Nantucket Athenæum, which position she held about 20 years, meanwhile pursuing mathematical and astronomical studies. From her early years she had assisted her father in making observations; and, 1847, Oct. 1, she discovered a comet for which she was awarded the prize of a gold medal by the king of Denmark. She made observations for the U. S. Coast Survey and compilations for the *Nautical Almanac*. During a tour in Europe, 1858, she visited the principal observatories and was an honored guest of the leading scientists. Upon her return she was presented with a fine telescope by the women of America. In 1865 she became director of the observatory and prof. of astronomy at Vassar College. Early in 1888 she resigned, on account of ill health and advancing years. Her resignation was not accepted, but she was given leave of absence. She was a member of several scientific societies and was the first woman to be elected to membership by the American Acad. of Arts and Sciences. She died at Lynn, Mass.

MITCHELL, PETER: 1824, Jan. 4; b. Newcastle, New Brunswick. He was educated in his native town, and, 1848, was admitted to the bar, but soon became interested in ship-building and politics. He was chosen, 1856, representative to the provincial parliament and after five years of service in that capacity was made life member of the legislative council. He was prominent in the movement for confederation of the provinces of Brit. America and for construction of the Intercolonial railroad, and was repeatedly chosen delegate to Canada and England in behalf of these projects. He served in the senate several years, but resigned 1872, and was minister of marine and fisheries under the Macdonald administration. He was prominent in the settlement, 1878, of the fishery troubles between Canada and the United States. He was elected representative, 1882, from his native county to the Dominion parliament, was one of the chief promoters of the Canada Pacific railway, and for several years has been pres. of the company publishing the *Montreal Herald*.

MITCHELL, SAMUEL AUGUSTUS: 1792, Mar. 30—1868, Dec. 20; b. Bristol, Conn. He became a popular teacher, and in middle life removed to Philadelphia, where he applied himself to the preparation of geographical works for schools, including text-books, atlases, and maps, of which he published 24 vols. His works had immense sale, and were the leading geographical school-books of the day. He published other works, among which were *General View of the World*, and *New Travellers' Guide through the United States*. He died in Philadelphia.

MITCHELL, SILAS WEIR, M.D., LL.D.: 1829, Feb. 15; b. Philadelphia. He graduated 1850 from the Jefferson Medical College, had charge of a hospital during the civil war, has been pres. of the Philadelphia College of Physicians, and is a member of various scientific societies. He has made careful investigation of nervous diseases, the poison of serpents, etc. Dr. M. has fine literary gifts, and besides his medical books and papers he has published a volume of poems and several novels.

MITCHELL'S PEAK: see BLACK MOUNTAINS.

MITE, n. *mīt* [OF, *mite*, the smallest of coins—from O.Dut. *mijte*, small: Dut. *mijt*, a very small coin: OE. *mynutis*, a very small coin: Port. *miudo*, little (see MINUTE 1)]: in *Scrip.*, a small coin, equal to about one-third of a farthing (about one-sixth of a cent): the OE. mite was of about the same value; a very little thing; a minute particle.

MITE, n. *mīt* [Dut. *mijte*; Sp. *mita*; F. *mite*, a mite: prov. Sw. *smit*; Gael. *smiot*, a particle: Gr. *midas*, a little creature that eats beans]: small insect not easily seen by the naked eye, found in cheese and many other substances. MITY, a. *mītī*, containing mites.—*Mite* is a name given to the *Acarides* generally (see ACARUS); sometimes only to those of them which have the feet formed for walking, and the mouth furnished, not with a sucker formed of lancet-like plates, as in the Ticks (q.v.), but with mandibles. All are small creatures; the species are very numerous; they feed chiefly on decaying animal and vegetable substances, or are parasitical on quadrupeds, birds, and insects. The CHEESE M. (*Acarus domesticus*, figured in the article ACARUS) is one of the best known species; another is the FLOUR M. (*A. farinæ*), too common among flour, in both of which the body is covered with hairs very large in proportion to its size, and capable of a considerable amount of motion. The SUGAR M. (*A. saccharinus*) swarms in almost all soft sugar; but refined and crystallized sugar seems to defy its mandibles, and is free of it. The surface of jelly and preserves, when it has begun to become dry, is often covered with multitudes of very small mites. A species of M. is the cause of Itch (q.v.); and many of the lower animals are infested by parasites of this tribe. Beetles may often be seen absolutely loaded by a species which preys on them; and bird-fanciers regard with the utmost horror the RED M., which lurks in crevices of cages and aviaries, and sucks the blood, and eats the feathers of their inmates.

MITER: see MITRE.

MITFORD, *mīt'ford*, MARY RUSSELL: English authoress: 1786, Dec. 16—1855, Jan. 10; b. Alresford, Hants; only child of a physician. At the age of ten, she was sent to a boarding-school at Chelsea, and also placed under the guidance and tuition of Miss Rowden, a lady of a literary turn, who had educated Lady Caroline Lamb, and was afterward instructress of Miss Landon and of Fanny

MITFORD.

Kemble. During the five years that she spent at Chelsea, she read with avidity, studying the tragic authors of France, Shakespeare, and the early dramatists of England. At the age of 15, she returned home, and before she was 20, she published three vols. of poetry. These having been severely castigated by the *Quarterly Review*, she applied herself to writing tales and sketches for the magazines. The profession which she had adopted from taste she continued from necessity; for her father, an idle and spendthrift gentleman, had exhausted a fortune of £20,000 drawn as a lottery prize, which left him dependent on his daughter, who exercised over him a motherly care, and indulged him in the exactions which were natural to his easy good-nature. The first vol. of *Our Village* appeared 1824, and the five vols. completed 1832. Of the more important of her dramatic works, *Julian* was performed first 1823; *Foscari* 1826; and *Rienzi* 1828—all, especially the last, with success. Among her other important works, are *Recollections of a Literary Life* (3 vols. 1852); *Atherton* (a novel, 3 vols. 1854) and *other Tales*. Miss M. published a collected ed. of her dramatic works, 2 vols. 1854. In 1838, she received a pension from govt., but neither this, nor the growing ill-health of her later years, induced her to relax her literary industry. She died at her residence, Swallowfield Cottage, near Reading. Successful both as compiler and as author, Miss M. produced many interesting volumes; but her fame—if the admiring respect for an amiable lady and a woman of graceful literary genius may be so called—rests chiefly on the sketches of country life which compose *Our Village*. These sketches are memorable chiefly for their style, which is unaffected, spontaneous, vivacious, genial, and humorous, revealing a charming character. Five vols. of her *Life and Letters* appeared 1870–72; and two vols. of *Letters to her*, 1882.

MITFORD, WILLIAM: 1744, Feb. 10—1827, Feb. 8; 5. London. He studied at Queen's College, Oxford, but left the univ. without taking his degree. In 1761, he succeeded to the family estate; and 1769 became a capt. in the South Hampshire militia. M.'s first work, *An Inquiry into the Principles of Harmony in Languages, and of the Mechanism of Verse, Modern and Ancient*, appeared 1774; but by far his most important publication was his *History of Greece*, the first vol. of which appeared 1784, and the last 1818; a pugnacious, opinionated, and even fanatical production. The author is an intense hater of democracy, and can see in Philip of Macedon nothing but a great statesman, and in Demosthenes, nothing but an oratorical demagogue. Yet his zeal led him for substantiating his views, to search minutely and critically certain unexplored portions of Greek history; this gave M.'s work a high place in the opinion of scholars until the appearance of Thirlwall and Grote.

MITHRADATES.

MITHRADATES, *mīth-ra-dā'tēz*, improperly, MITHRIDATES [from Persian *Mithras* (q.v.) or *Mithra*, 'the sun,' and an Aryan root *da*, to give; hence 'sun-given' or 'sun-born']: name of several kings of Pontus, Armenia, Commagene, Parthia, and the Bosphorus; all of whom have sunk into insignificance, with the exception of Mithradates VI. of Pontus, surnamed EUPATOR and DIONYSUS, but more generally known as M. THE GREAT: prob. abt. B.C. 132-63 (reigned about B.C. 120-63). Little is known of his early career. He succeeded his father before 13 years of age, and soon subdued the tribes who bordered on the Euxine, as far as the Chersonesus Taurica (Crimea); and after the death of Parysatis, incorporated the kingdom of the Bosphorus with his dominions. The jealous behavior of the Romans and the promptings of his own ambitious spirit incited him to invade Cappadocia and Bithynia, but a wholesome fear of the power of the Great Republic induced him to restore his conquests. The *First Mithridatic War* was commenced by the king of Bithynia B.C. 88, who, at the instigation of the Romans, invaded Pontus. M. sent an ambassador to Rome to complain of this treatment, but he was sent back with an evasive reply. M. immediately began hostilities, and his generals repeatedly defeated the Asiatic levies of the Romans, and he himself took possession of Bithynia, Cappadocia, Phrygia, and the Roman possessions in Asia Minor, the inhabitants of which last hailed him as deliverer. By his orders, a great massacre of the Romans took place, in which, according to one account, 80,000, according to another 150,000 were slain. He also sent three powerful armies to aid the Greeks in their rebellion, but the disastrous battles of Chæronea and Orchomenus broke his power in that country. He was driven from Pergamus B.C. 85 by Flavius Fimbria, and reduced to the necessity of making peace with Sulla, relinquishing all his conquests in Asia, giving up 70 war-galleys to the Romans, and paying 2,000 talents. The wanton aggressions of Murena, Roman legate, gave rise to the *Second Mithridatic War*, B.C. 83. M. was wholly successful in this war, but peace was concluded on the *status quo*, B.C. 81. M. felt, however, that this was merely a truce, and lost no time in preparing for a third contest, in alliance with Tigranes, King of Armenia, the next most powerful monarch of w. Asia. Tigranes seized Cappadocia B.C. 76, and M., in the following year, invaded Bithynia, commencing the *Third Mithridatic War*. M. formed an alliance with Sertorius (q.v.), and obtained the services of Roman officers of the Marian party, who trained his army after the Roman manner. The arms of M. were at first successful; but afterward the Roman consul Lucullus (q.v.) compelled him to take refuge with Tigranes, B.C. 72. Lucullus then conquered Pontus, defeated Tigranes, B.C. 69, at Tigranocerta, and both Tigranes and M. at Artaxata, B.C. 68. M., however, recovered possession of Pontus. After the war had

lingered some time, Cneius Pompeius (see POMPEY), completed the work of Lucullus, defeating M. on the Euphrates B.C. 66, and compelling him to flee to the Bosphorus. Here his indomitable spirit prompted him to a new scheme of vengeance, but it was frustrated by the rebellion of his son, Pharnaces, who besieged him in Panticapæum. Deeming his cause hopeless, M. put an end to his own life. M. was a specimen of the true eastern despot; he had the ability that is given by irresponsible power, unbounded ambition, and merciless hate of foes, and that manifests itself in courage, extraordinary energy, and perseverance. His treachery and cruelty were frightful; he murdered his mother, his sons, his sister, who was also his wife, his concubines, and his most intimate friends. Superstition became to him a science; he was a great student of magic, and the accounts of him which pass for history read like extracts from the *Arabian Nights*. His physical stature and strength were wonderful. His want of success was owing not altogether to his defects as a general, but largely to the impossibility of raising and training an army of Asiatics capable of coping with the Roman legions; and his system of tactics during the third Mithridatic war plainly shows his conviction of this fact. He had received a Greek education with its outward polish at Sinope, could speak 22 different languages and dialects, and possessed considerable love for the arts, of which his magnificent collections of pictures, statues, and engraved gems were a proof. In the estimation of the Romans, he was the most formidable opponent they ever encountered, and occasional reports of his successes spread terror among them.

MITHRAS, *mīth'ras* (cf. Sanskrit *Mitram*, friend): highest of the 28 second-class divinities of the anc. Persian Pantheon, the *Ized* (Zend. *Yazata*) or genius of the bright heaven or the day, and ruler of the universe. Later, M. became quite identified with the sun as a god. Protector and supporter of man in this life, he was believed to watch over his soul in the next, defending it against the impure spirits, and transferring it into the realms of eternal bliss. In the Persian mythology, he is all-seeing and all-hearing, and, armed with a club—his weapon against Ahriman and the evil *Devs*—he unceasingly ‘runs his course’ between heaven and earth. The ancient monuments represent him as a beautiful youth, in Phrygian garb, kneeling on an ox, into whose neck he plunges a knife; several minor, varying, allegorical emblems of the sun and his course, surrounding the group. At times, he is represented as a lion, or the head of a lion. The most important of his many festivals was his birthday, celebrated Dec. 25. The worship of M. early found its way into Rome; it was regularly established by Trajan about A.D. 100, and the mysteries of M. (*Hierocoracica*, *Coracica Sacra*), which fell in the spring equinox, were famous even among the many Roman festivals. The ceremonies observed in the initiation

MITIGATE—MITRAILLEUSE.

to these mysteries—symbolical of the struggle between Ahriman and Ormuzd (the Good and the Evil)—were extraordinary and even dangerous. Baptism and the partaking of a mystical liquid, consisting of flour and water, to be drunk with the utterance of sacred formulas, were among the inaugurative acts. The seven degrees—according to the number of the planets—were, 1. Soldiers: 2. Lions (in the case of men), or Hyenas (in that of women): 3. Ravens: 4. Degree of *Perses*: 5. of *Oromios*: 6. of *Helios*: 7. of Fathers—the highest—called also Eagles and Hawks. At first, it was a merry worship—thus the king of Persia was allowed to become drunk only on the Feast of the Mysteries; but the solemnities gradually assumed a rigorous aspect. From Persia, the cultus of M. and the mysteries were imported into Asia Minor, Syria, Palestine, etc., and it is probable that in some parts human sacrifices were connected with it. Through Rome, where this worship, after many vain endeavors, was finally suppressed A.D. 378, it may be presumed that it found its way into w. and n. Europe; and many tokens of its former existence, e.g., in Germany, are still found, such as the M. monuments at Hedernheim, near Frankfurt-on-the-Maine, and at other places. Among chief authorities on this subject are Anquetil du Perron, Creuzer, Silvestre de Sacy, Lajard, O. Müller (*Denkmäler d. alten Kunst*). See GUEBRES: PARSEES: ZENDAVESTA.

MITIGATE, v. *mīt'ī-gāt* [L. *mitigatus*, softened, allayed or eased—from *mitis*, soft, mild: It. *mitigare*: F. *mitiger*]: to alleviate or ease, as sufferings; to reduce or lessen, as a penalty or a disease; to soften; to appease; to soothe. MITIGATING, imp.: ADJ. alleviating; moderating. MITIGATED, pp.: ADJ. alleviated; moderated. MITIGANT, a. *mīt'ī-gānt*, softening; diminishing or easing, as pain: N. that which eases or lessens. MITIGATOR, n. *-gā-tēr*, one who or that which mitigates. MITIGABLE, a. *mīt'ī-gā-bl*, that may be alleviated or lessened. MITIGA'TION, n. *-gā'shūn* [F.—L.]: the act of mitigating; the diminution or lessening of anything painful, severe, or calamitous. MITIGATIVE, a. *-gā-tīv*, tending to lessen or alleviate.—SYN. of 'mitigate': to allay; alleviate; pacify; relieve; assuage; calm; abate; cool.

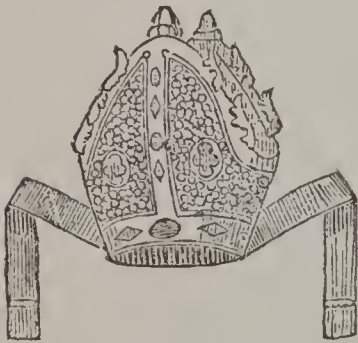
MITRAILLEUSE, n. *mīt'rāl-yéz'*, MITRAILLEUS'ES, n. plu. *-yāz'éz* [F.—from *mitraille*, case or grape shot: *mitrailer*, to fire with grape or case shot]: a many-barrelled gun, having the barrels laid together like a fagot of sticks, and securely attached to each other, loaded with great quickness by an apparatus at the breech, and discharged each barrel singly, or the whole nearly simultaneously: see REVOLVER: GATLING GUN. Also sometimes used, MITRAILLEUR, n. *mīt'rāl-yār'*. MITRAILLE, n. *mīt-rāl'*, grape-shot.

MITRAL—MITRE.

MITRAL, a. *mī'trāl* [L. and Gr. *mitra*, a head-dress, a mitre]: having the form of a mitre; in *anat.*, applied to a valve attached to the circumference of the left auriculo-ventricular orifice, whose flaps are supposed to resemble the segment of a bishop's mitre; the bicuspid valve.

MITRE, n. *mī'tér* [F. *mitre*, an episcopal crown—from L. and Gr. *mitra*, a headband, a turban: It. *mitra*]: in *R. Cath. Ch.*, a sort of crown worn on solemn occasions by archbishops, bishops, and sometimes by abbots; episcopal dignity; the junction of objects, e.g., the point or line of union of moldings meeting at an angle usually of 45°. **V.** to adorn with a mitre; to unite at an angle of 45°. **MITRING**, imp. *mī'trīng*. **MITRED**, pp. *mī'térd*: **ADJ.** wearing or possessing a mitre; episcopal; cut or jointed to meet at an angle. **MITRAL**, a. *mī'trāl*, mitre-shaped; pertaining to a mitre. **MITRE-BOX**, a box or trough with vertical cuts through the sides to guide the saw in cutting work to form mitre-joints. **MITRE-SQUARE**, an immovable bevel for striking an angle of 45°. **MITRE-WHEELS**, in *mech.*, a pair of bevel-wheels of equal diameter working into each other, usually with their axes at right angles.

MITRE: head-dress worn in solemn church services by bishops, abbots, and certain other prelates in the Western Church. The name, as probably the ornament itself, is borrowed from the orientals, though, in its present form, it is not in use in the Greek Church, or in any other of the churches of the various eastern rites. The western M. is a tall, tongue-shaped cap, terminating in a twofold point supposed to symbolize the 'cloven



Mitre.

tongues' in the form of which the Holy Spirit was imparted to the apostles (Acts ii. 3), and is furnished with two flaps, which fall behind over the shoulders. Opinion is divided as to the date at which the M. came first into use. Eusebius, Gregory of Nazianzus, Epiphanius, and others speak of an ornamented head-dress, worn in the church; but there is no very early monument or pictorial representation which exhibits any head-covering at all resembling the modern M. From the 9th c., however, it is found in use, though not universally; and instances are recorded in which the popes grant permission to certain bishops to wear the M.; e.g., Leo IV. to Ansehar, Bp. of Hamburg, 9th c. The material used in the M. is very various, often consisting of most costly stuffs, studded with gold and precious stones. The color and material differ according to the festival or the service in which the M. is used, and there is a special prayer in the consecration service of bishops, used in investing the new bishop with his mitre. The M. of the pope is of peculiar form, and is called by the name of *Tiara* (q.v.). Although the mitre properly belongs to bishops

MITRE SHELL—MITRIFORM.

only, its use is also permitted by special privilege to certain abbots, to provosts of some distinguished cathedral chapters, and to a few other dignitaries. See Binterim, *Denkwürdigkeiten der Kirche*, 1 B. 2 Th. 348.

The M., as an ornament, seems to have descended in the earliest times from bishop to bishop. Among the Cottonian mss. is an order, dated July 1, 4 Henry VI., for the delivery to Abp. Chicheley of the M. worn by his predecessor. It was in some cases very costly. In England, after the Reformation, the M. was no longer a part of the episcopal costume till 1885, when it was resumed by the new Bp. of Lincoln; but in heraldry it is placed over the shield of an abp. or bp., instead of a crest. The M. of a bp. has its lower rim surrounded with a fillet of gold; but the Abps. of Canterbury and York are in the practice of encircling theirs with a ducal coronet, a usage of late date and doubtful propriety. The Bp. of Durham surrounds his M. with an earl's coronet, in consequence of being titular Count Palatine of Durham, and Earl of Sedburgh. Before the custom was introduced of bishops impaling the insignia of their sees with their family arms, they sometimes differenced their paternal coat by the addition of a M. Mitres are rare as a charge in heraldry, but are sometimes borne as a crest, particularly in Germany, to indicate that the bearers were feudatories, or dependencies of ancient abbeys.

MITRE SHELL: name for the shells of several species of *Mitra*, genus of gasteropods belonging to the family *Volutidæ*. These shells are of great beauty, especially that known as the bishop's mitre shell. The shell of *Mitra* is fusiform, thick, spire elevated, acute; aperture small, notched in front; columella obliquely plaited; operculum very small. The animal has a long proboscis; and, when irritated, emits a purple liquid having a very offensive smell. The eyes are situated on the tentacles or at their base. Over 100 fossil and 400 recent species have been described. In the bishop's (*M. episcopalis*), the animal has a narrow foot, compressed at its root, nearly square and slightly articulated in front with a margined furrow, and pointed behind; eyes sessile at the base of the tentacles; the proboscis twice the length of the shell. The shell is turreted, smooth, white, spotted with bright red; pillar four plaited; outer lip denticulated at its lower part; epidermis thin. It is found in E. Indian seas and islands of the S. Sea. The different species are found at depths varying from the surface to 17 fathoms, on reefs, sandy mud, and sands. They all are inhabitants of warm countries.

MITRIFORM, a. *mī'trī-fawrm* [L. *mitra*, a headband; *forma*, shape]: in *bot.*, shaped like a mitre; conical; hollow and open at the base.

MITSCHERLICH—MITTENS.

MITSCHERLICH, *mīt'shēr-līch*, EILHARDT: Prussian chemist: 1794, Jan. 7—1863, Aug. 28; b. Neuende, near Jena. At the Univ. of Heidelberg he studied history, philology, and oriental languages; and later at Paris and Göttingen. At Göttingen (1814 or 15) he seems first to have turned his attention to geology and mineralogy, chemistry and physics; and at Berlin, 1818, he selected chemistry as his special study. His observations on the striking similarity between the crystalline form and the chemical composition of the arseniates and the phosphates, led to his discovery of the law of Isomorphism (q.v.), the importance of which was so fully recognized by Berzelius, that he invited the young chemist, 1819, to Stockholm, where he studied till 1821, when, on the death of Klaproth, he was, on recommendation of Berzelius, appointed to the vacant chair of chemistry at Berlin. One of his earliest discoveries after his appointment was that of the double crystalline form of sulphur, the first observed case of Dimorphism: see DIMORPHISM. His investigations regarding the formation of artificial minerals, and his memoirs on Benzine and on the Formation of Ether are among his most important contributions to chemistry; but mainly on the discovery of Isomorphism and Dimorphism his reputation will finally rest. His principal work is *Lehrbuch der Chemie*, begun 1829, concluded 1841. It has passed through five editions, and is especially valuable for the clear and simple way in which he has brought mathematics and physics to bear upon the subject. He was an honorary member of almost all the great scientific societies, and received the gold medal from the Royal Soc. of London for his discovery of the law of Isomorphism. He died at Berlin.

MITTAU, *mīt'tow*, or **MITAU**, *mē'tow*: chief town of the govt. of Courland, European Russia; on the right bank of the Aa, 25 m. s.w. of Riga; founded 1271 by the grand master of the Teutonic Knights. It was annexed to Russia 1795. The majority of the people are Germans by birth or descent, 1,000 are Jews, and only a few Russians. The town is indifferently built, the houses being chiefly of wood, and painted green or brown. The most important buildings are the old castle—now the seat of the gov. of the province—four churches, an astronomical observatory, a public library, a museum, and a number of educational and charitable institutions. As regards commerce and industry, the town occupies only the third place in the govt., its principal product being articles of japanned iron and tin; there is export trade in hemp, flax, and corn. M. is the winter residence of the gentry of the surrounding country, and was for some time the abode of Louis XVIII. Pop. (1880) 23,847.

MITTENS, n. plu. *mīt'nz* [F. *mitaine*, a winter glove: comp. Gael. *mutan*, a muff, a thick glove; *mutag* and *miotag*, a glove without fingers]: rough coverings for the hands to protect them from the cold; gloves without a separate covering for each finger; gloves without fingers. **TO HANDLE WITHOUT MITTENS**, to use roughly.

MITTIMUS, n. *mĭt'ti-mūs* [L. *mittimus*, we send]: in law, writ for transfer of records from one court to another; warrant of commitment to prison, given by a magistrate—called usually a commitment: it is addressed to the keeper of the prison, and must describe with reasonable certainty the name (or if that be not known, the person) of the prisoner.

MITTS, n. plu. *mĭts* [contracted from *mittens*, which see]: gloves which do not cover each finger separately, which protect the hand without wholly covering the fingers.

MITTWEIDA, *mĭt'vī-dâ*: town of Saxony, circle of Zwickau, 35 m. s.e. of Leipzig. For centuries, M. has been noted for industry, of which the principal branches are spinning, cotton-weaving, manufacture of fustian, etc., together with dyeworks and bleach-fields. Pop. (1880) 9,218; (1890) 11,208.

MITY: see under MITE 1.

MITYLE'NE, or **MYTILE'NE**: see **LESBOS**.

MIVART, ST. GEORGE, PH.D., M.D., F.R.S.: naturalist, teacher, and author; 1827, Nov. 30; 1900, April 1. b. London, Eng. He studied at Clapham and Harrow schools, and at St. Mary's College (Rom. Cath.), Oscott. He was called to the bar 1851, but afterward turned to medical studies, and having taken his degree at St. Mary's, 1862, became prof. of biology in University college, Kensington, 1874; prof. of philosophy of nat. hist. at Louvain, 1890. He was author of numerous works, largely in opposition to certain aspects of Darwinism. Noteworthy are his *Genesis of Species* (1871), *Nature and Thought* (1883), *Origin of Human Reason* (1889), *Types of Animal Life* (1893).

MIX, v. *mĭks* [Ger. *mischen*; Bohem. *misyti*; Gr. *misgein*, to mix: L. *mixtus*, mingled or mixed: Gael. *masg*, to infuse, to mix: W. *mysgu*, to mix]: to mingle or blend two or more substances into one mass; to join or unite, as with a crowd; to associate; to become united or blended; to be joined or associated. **MIX'ING**, imp. **MIXED**, pp. *mĭkst*: ADJ. consisting of various kinds; promiscuous; not pure. **MIXABLE**, a. *mĭks'ă-bl*, that may or can be mixed. **MIXER**, n. *mĭks'ér*, one who or that which mixes. **MIX'EDLY**, ad. *-ĕd-lĭ*. **MIXTURE**, n. *mĭks'-tūr* or *-chūr* [L. *mixtura*, a mingling together]: act of mixing; state of being mixed; a mass or compound formed by mixing two or more substances together; an ingredient added and mixed. In *medicine*, officinal preparations, extempore in their nature, some of which—e.g., *Mistura Camphoræ*, *Mistura Cretæ*, and *Mistura Ferri Composita*—are extensively used in medical practice, either as vehicles for more active remedies, or for their intrinsic value. In *organs*, a compound stop of two to five ranks of small metallic pipes, in tone resembling the sesquialtera, though more shrill.—**SYN.** of 'mix': to confuse; mingle; confound; associate; compound;—of 'mixture': compound; medley; union; association; admixture; intermixture; composition,

MIXED MARRIAGES.

MIXED MARRIAGES: term applied to marriages between persons of differing religions, or of opposing forms of the same religion. In various countries of Europe, such marriages have either been prohibited or put under restrictions. The canon law forbade marriages between Christians and non-Christians; at one time it merely discouraged, at another altogether prohibited, the marriage of orthodox Christians with heretics. Subsequently to the Reformation, papal dispensations were in use to be granted for marriages between Rom. Catholics and Protestants, with the condition annexed that the children should be brought up in the Rom. Cath. faith. During the latter part of the 17th c., parents seem to have been left at liberty to make what agreement they pleased on this head; and in default of their making any, it was presumed that the children would follow the religion of their father. In the middle of the 18th c., the validity of mixed marriages, even when celebrated by the civil magistrate, was recognized by the papal court; and under Napoleon's rule they became common, without stipulations as to the children. The events of 1815 restored sufficient influence to the Rom. Cath. Church, to enable the clergy to put in force a rule by which they could refuse to celebrate such marriages without an assurance that the children would be brought up Rom. Catholics. By the law of many of the German states, the clergyman of the bride was the only person who could competently officiate, and an engagement of this kind was often not only repugnant to the father as a Prot., but illegal. Conflicts followed between the civil and ecclesiastical authorities, which have sometimes been obviated by the priest, on whom the law imposes the celebration of the marriage, not pronouncing the nuptial benediction, but giving his presence as a witness with two other witnesses when the parties declared themselves husband and wife—a kind of marriage whose validity is perfectly recognized by the canon law. In Spain, marriages between Rom. Catholics and Protestants have sometimes taken place in this way, avoiding the stipulations otherwise necessary regarding the children.

There was, till lately, great diversity in the state of the law of mixed marriages in different parts of Germany. Prussia was the first state to do away the former restrictions by the recognition of a civil ceremony alone as that which constitutes marriage in the eye of the law. Until that change, the letter of the law provided that the children should be brought up in the faith of their father, and no compacts to the contrary were allowed. Practically, however, the law was largely evaded, no one having a recognized interest to object to the fulfilment of such agreements. In Bavaria, mixed marriages might be performed either by Prot. or Rom. Cath. clergymen; and the spouses had it in their power to make what arrangements they pleased regarding the children before or after marriage; but if no such ar-

MIXED MARRIAGES.

rangements had been made, the children were brought up in the religion of their father. In Saxony, and various other German states, the law was nearly the same. A bill for rendering civil marriage obligatory throughout the empire was brought before the Reichstag 1874, and passed 1875, thus extending the system of Prussia to all other German states. This bill enables men and women to be married independently of the consent of the clergy (not always easily obtained in Rom. Cath. districts), or of the difference of their religious beliefs. It also allows of children being left unbaptized, and brought up without being assigned to any religious denomination whatsoever. In Austria, the interposition of the Rom. Cath. priest is required in marriages between Rom. Catholics and Protestants. He need not, however, give the sacerdotal benediction; his passive assistance only is required, either in taking the declaration of the parties, which is followed by a Prot. ceremony, or by being present as a witness at the Prot. ceremony. When the husband is Rom. Cath., all the children must be brought up Rom. Catholics; when the husband is Prot. and the wife Rom. Cath., the sons follow the father and the daughters the mother. In Denmark, stipulations may be made before or after marriage, and can be altered by mutual consent of the parents, or, in some cases, even after the death of one of them. Mixed marriages were, till lately, altogether prohibited in some of the Rom. Cath. cantons of Switzerland, but they are now authorized in all the cantons by the federal laws: it is generally the clergyman of the husband's creed who officiates, but at Zürich the ceremony is performed in both churches. In most cases, the children are required to be educated in the religion of their father.

In most German states, marriages between Christians and Jews or Mohammedans used to be interdicted; but after 1849, the prohibitions were in individual cases dispensed with. In Denmark, such marriages have been permitted, on condition of the children being brought up Protestants. In Russia, the members of both Greek and Roman communions are prohibited from intermarrying with non-Christians: members of the orthodox Greek Church cannot marry Greek sectaries; but when an orthodox Russian marries a Prot. or Rom. Catholic, the benediction must be given in the Greek Church, and the children baptized in the Greek communion. When the parents are of different religions, but neither belongs to the Greek Church, ante-nuptial stipulations will be given effect; if none have been made, the sons follow the father's faith, the daughters the mother's.

In France, the law regards marriage as a purely civil contract, and recognizes only the civil celebration, which is completely separated from the religious rite. As the faith of the parents is not taken cognizance of, questions regarding the religious education of the children cannot arise before the civil tribunals.

MIXED RACES.

The only restriction to which mixed marriages are now subjected in any part of the United Kingdom is applicable to Ireland only, that a marriage celebrated by a Rom. Cath. priest between a Rom. Catholic and a Protestant, or a person who within 12 months has been or professed to be a Protestant, or between two Protestants, is null.

In the United States, differences in religion are not the subject of legal prohibition or restriction in relation to marriage.

MIXED RACES: subject intimately connected with an enlarged study of ethnology. It involves a consideration of the phenomena attendant on the sexual union between individuals belonging to different varieties of the human race; e.g.—adopting the classification of Blumenbach—between the European and the negro or the American Indian; or between the American Indian and the negro; or between any of these three and individuals belonging to the Malay or Mongolian varieties. It is well understood that such unions are in general prolific; and not only so, but that their offspring is likewise prolific; and this fact is much relied on by some ethnologists, as an argument in favor of the unity of the human race. They reason thus: Were the different varieties of mankind distinct species, as has been frequently alleged, then it would necessarily follow that the offspring of such unions would prove as unfruitful as those between the horse and the ass, the goat and the sheep, the wolf and the dog; and similarly with respect to the hybrids among birds, insects, and plants. To sum up, in the words of Dr. Prichard, best exponent of this school of ethnology: ‘It seems to be the well-established result of inquiries into the various tribes of organized beings, that the perpetuation of hybrids, whether of plants or animals, so as to produce new and intermediate tribes, is impossible. Now, unless all these observations are erroneous, or capable of some explanation that has not yet been pointed out, they lead, with the strongest force of analogical reasoning, to the conclusion, that a number of different tribes, such as the various races of men, must either be incapable of intermixing their stock, and thus always fated to remain separate from each other, or, if the contrary should be the fact, that all the races to whom the remark applies, are proved by it to belong to the same species.’ Dr. Prichard further observes, that so far from such unions between members of different varieties of the human race proving unfruitful, or their offspring unfruitful, the opposite is the case;—e.g., in unions between the negro and the European, the most strongly marked varieties of our race. ‘If we inquire,’ he says, ‘into the facts which relate to the intermixture of negroes and Europeans, it will be impossible to doubt the tendency of the so-termed Mulattoes to increase. The men of color, or the mixed race between the Creoles, and the negroes, are in many of the W. India Islands a

MIXED RACES.

rapidly increasing people, and it would be very probable that they will eventually become the permanent masters of those islands, were it not for the great numerical superiority of the genuine negroes. In many parts of America they are also very numerous.' It is to America, indeed, both N. and S., that we must chiefly look for the numerous and varied phenomena resulting from this intermixture of races; for there are not only the negro and the European mingling their blood, but the negro and the American Indian, the European and the Indian, and the offspring of each of these with the offspring of the other, or with members of either of the parent stocks; added to which, of late years, the Chinese (of Mongolian race or variety) have appeared upon the scene, thus contributing greatly to the number of what are termed *human hybrids*. All these, however, are not equally fertile; and with respect even to the Mulattoes, it is alleged by writers of the Morton school of ethnology that they do not perpetuate themselves for more than a few generations. 'Nature,' says Squier, rather dogmatically, 'perpetuates no human hybrids—e.g., a permanent race of Mulattoes.' And Dr. Nott, adopting the classification of species laid down by Dr. Morton—namely, *Remote Species*, in which hybrids are never produced; *Allied Species*, which produce, *inter se*, an unfertile offspring; and *Proximate Species*, which produce with each other a fertile offspring—is of opinion that it is only by the union of southern or dark-skinned Europeans with negroes that thoroughly prolific Mulattoes are engendered, which is not the case in unions between individuals of the Anglo-Saxon and negro races. In arriving at this conclusion, we cannot avoid thinking that the author has been helped forward by the strong prejudice in the Southern States against all taint of negro blood. A more impartial writer, Prof. Wilson, in his *Prehistoric Man*, observes: 'There are upwards of four millions of people of African blood in the United States, and certainly not less than ten millions throughout the continent and islands of N. and S. America, and of these the larger proportion consists of hybrids [these figures are much less than the present number]. . . . It is impossible to determine with certainty how far the hybrid colored population of the United States is capable of permanency, either by the development of a fixed hybrid type, or by continuous fertility, until the predominant primary type reasserts its power, by their return to that of the original white or black parent, so long as the mixed breed is constantly augmented in the Southern States by means at variance with the natural and moral relations of social life' [these conditions have largely been changed]. As it is, the weight of evidence appears to be in favor of Dr. Prichard's view; but until the doctrine of hybridity is better understood, and a more satisfactory answer to the vexed question, 'What is species?' has been supplied to us, we must deem it idle to pronounce dogmatically

MIXTECAS--MIXTILINEAL.

on the subject: see HYBRID: SPECIES: MISCEGENATION: also ETHNOLOGY. The following is a list of half-castes given by Dr. Tschudi, 'with a few additions from other sources,' printed in the appendix to Prof. Wilson's valuable work above mentioned.

Father.	Mother.	Half-caste.
White, . . .	Negro, . . .	Mulatto.
White, . . .	Indian, . . .	Mestizo.
Indian, . . .	Negro, . . .	Chino.
White, . . .	Mulatta, . . .	Cuarteron.
White, . . .	Mestiza, . . .	{ Creole, only distinguished from the white by a pale brown complex- ion.
White, . . .	Chinese, . . .	
White, . . .	Cuarterona, . . .	Chino-blanco.
White, . . .	Quintera, . . .	Quintero.
Negro, N. A.	Indian, . . .	White.
Negro, S. A., .	Indian, . . .	Zambo or Cariboco.
Negro, . . .	Mulatta, . . .	Mameluco.
Negro, . . .	Mestiza, . . .	Zambo-negro or Cubra.
Negro, . . .	Chinese, . . .	Mulatto-oscuro.
Negro, . . .	Zamba, . . .	Zambo-Chino.
Negro, . . .	Cuarterona, . . .	Zambo-negro (perfectly black).
Negro, . . .	Quinterona, . . .	Mulatto (rather dark).
Indian, . . .	Mulatta, . . .	Pardoc.
Indian, . . .	Mestiza, . . .	Chino-oscuro.
Indian, . . .	China, . . .	{ Mestizo-claro (frequently very beautiful).
Indian, . . .	Zamba, . . .	
Indian, . . .	China-Cholo, . . .	Chino-cholo.
Indian, . . .	Cuarterona, . . .	Zambo-claro.
Indian, . . .	Quintera, . . .	Indian (with short frizzly hair).
Mulatto, . . .	Mestiza, . . .	Mestizo (rather brown).
Mulatto, . . .	China, . . .	Mestizo.
Mulatto, . . .	Mestiza, . . .	Zambo.
Mulatto, . . .	China, . . .	{ Chino (of rather clear complex- ion).
Mulatto, . . .	Mestiza, . . .	
Mulatto, . . .	China, . . .	Chino (rather dark).

MIXTECAS, *mēs-tā'kas*, or MIZTECS: one of the Indian nations of Mexico, who came at an early period from the n., took possession of the region now the states of Oajaca, Guerrero, and Puebla, and after the Aztec conquest maintained an independent position in Oajaca. The civilization which they possessed produced fortresses, cities, and temples, of which remarkable remains are still seen; and a literature of primitive character, from which some religious treatises were printed in Mixtecan in the 16th and 17th c. They believed in a heaven, called Sosola, and made use of caves in the mountains as sacred places. They had a progressive industry, and were governed as tribal democracies by independent chiefs. There are 11 reported dialects of the Mixtecan language, which has no *b*, *f*, *p*, or *r*; indicates the plural by *cahite*, 'many,' added to the singular; abounds in personal pronouns; and varies the negative particle with the tense of the verb. The M. are now good citizens of Mexico, abiding secure in their mountain fastnesses.

MIXTILINEAL, a. *mīks'tī-līn'ē-āl*, or MIX'TILIN'EAR, a. *-ē-ēr* [L. *mixtus*, mixed; *linēā*, a line]: containing or consisting of lines of various kinds, as straight and curved.

MIXTURE—MOA.

MIXTURE: see under **Mix**.

MIZZEN, n. *mīz'n* [F. *misaine*, the foresail of a ship: It. *mezzana*, a triangular sail with a long sloping yard unequally divided, so that a small part at the lower end is before the mast—from *mezzo*, middle]: the aftermost of the sails of a ship: **ADJ.** hindmost; nearest the stern (this is its common use). **MIZZEN MAST**, the sternmost of the masts in a three-masted vessel, and also the smallest of the three. Above it, are the mizzen-topmast, the mizzen-top-gallant-mast, and the mizzen-royal. It supports the usual yards, and, in addition, the gaff and boom of the Spanker (q.v.). A rear-admiral hoists his pendant at the mizzen.

MIZZLE, v. *mīz'l* [Dut. *mist*, fog; *mieselen*, to rain fine: Low Ger. *musseln*, to mizzle]: to rain in very fine drops. **MIZZLING**, imp. *mīz'ling*. **MIZZLED**, pp. *mīz'ld*.

MNEMONIC, a. *nē-mōn'ik*, or **MNEMONICAL**, a. *-ī-kāl* [Gr. *mnēmē*, memory, remembrance; *mnemonikos*, belonging to memory]: assisting the memory. **MNEMONICS**, n. plu. *-iks*, the art of assisting the memory by certain rules and precepts; the rules which teach the method of assisting the memory: see **MEMORY**.

MNEMOSYNE, *nē-mōs'ī-nē*: in classical mythology, goddess of Memory, and mother of the nine Muses (q.v.), whom she bore to Jupiter. The principal seat of her worship was at Eleutheræ, in Bœotia.

MO, or **MOE**, ad. *mō* [AS. *má*; Scot. *ma* or *mae*, more]: in *OE.* and *Scot.*, more.

MOA, n. *mō'ā*: New Zealand name of the great wingless or struthious birds (see **BREVIPENNES**) of which the bones are found imbedded in the sands of the seashore, in swamps, forests, river-beds, and limestone caves, and of which traditions subsist among them as birds living in their country. The largest bones belong to the genus *Di-nornis* (q.v.), others to *Palapteryx* (q.v.); and with them are found bones of a large bird (*Aptornis*), resembling a swan, supposed to be now extinct, also of the existing species of *Apteryx* (q.v.) and of *Notornis* (q.v.), much smaller birds. It is generally supposed that no large moas have been seen alive since about 1650; but it has recently been again alleged that some have been seen, and rewards have been offered for the capture of them. They are represented by the New Zealanders as stupid, fat, indolent birds, living in forests, mountain fastnesses, etc., and feeding on vegetable food. Their feet are said to have been adapted for digging. They seem to have been extirpated for the sake of their flesh, feathers, and bones. The eggs were eaten. See Prof. R. Owen's *Extinct Wingless Birds of New Zealand* (2 vols. 1878).

MOABITES—MOAT.

MOABITES, *mō'āb-īts*: pastoral people, descendants of Moab, son of Lot; former inhabitants of the mountainous country e. of the lower part of the Jordan and of the Dead Sea—known as the land of Moab, and about 3,000 ft. above the Jordan. By descent and in language the M. were related both to the Israelites and to the Edomites. Their heathenism was of the lowest grade. The national god was Chemosh. Baal-peor also was worshipped; though Jerome declares that the two are merely different conceptions of the same god. Their *cultus* was characterized by extreme licentiousness, and by many abominable rites, among which was human sacrifice (Am. ii. 1; II K iii. 27). In the time of the judges, the Jews were for 18 years under the yoke of the M., who were afterward made tributary by David, but, about B.C. 900, shook off their allegiance to the Jewish kings, and afterward took part with the Chaldeans against the Jews. The M. were a base and sensual people. Their name no longer exists, and the remnants of the people have long been included among the Arabs.

MO'ABITE STONE, THE: slab of black basalt, 3 ft. 8½ inches long, 2 ft. 3½ inches wide, 1 ft. 1.78 inches thick; bearing a long inscription in Hebrew-Phœnician letters; discovered by Mr. Klein of the British Missionary Soc., at Dibān in Moab 1868. It appears to have been erected by Mesha, King of Moab, mentioned in II Kings iii., and the inscription refers to his wars with Israel (B.C. 10th c.). Its date may be taken as about B.C. 890. The negotiations set on foot for its purchase led to quarrels among the Arab tribes claiming an interest in it, and the memorial was unfortunately broken to pieces. The fragments, however, were with great difficulty collected, were rejoined, and are now preserved in the Louvre at Paris. It is an interesting and valuable relic.

MOAN, v. *mōn* [AS. *mænan*, to moan: Swab. *maunen*, to speak with the mouth nearly shut; *maunzen*, to speak in a whining tone]: to give expression to sorrow or pain in prolonged audible sounds; to lament; to utter moans: N. an audible expression of grief or suffering; a low cry of sorrow. **MOAN'ING**, imp.: N. the act of one who moans. **MOANED**, pp. *mōnd*. **MOAN'FUL**, a. *-jûl*, sorrowful. **MOAN'FULLY**, ad. *-lī*.

MOAT, n. *môt* [OF. *mothe*, a little earthen fortress; *motte*, a lump of earth, a clod; *mote*, a dike: It. *mota*, a moat about a house: mid. L. *mota*, a hill or mound on which a fort was built]: a ditch or deep trench around a castle or around the ramparts of a fortress, sometimes filled with water: a *dry* moat should have a depth not less than 12 ft., and a width not less than 24. The more perpendicular the walls, so much the greater the obstruction to the enemy. In regular works, the walls are usually revêted with masonry; that at the foot of the rampart being the scarp or escarp, and that below the covered way the counterscarp (see DITCH: FORTIFICATION): V. to surround with a ditch for defense. **MOAT'ING**, imp.

MOB--MOBILE.

MOAT'ED, pp.: **ADJ.** surrounded or fortified by a moat.
Note.—**MOAT** meant originally a sod or turf, such as may be dug out, and used to form a mound, and hence in OE., 'an earthen wall to defend a house or place,' and then 'the trench so formed by digging': Bav. *mott*, peat dug for fuel: It. *mota*, mire; *motta*, a heap of earth, also a hollow: Sp. *mota*, a mound—see Skeat.

MOB, n. *mōb* [L. *mobilē*, easily moved, variable, as in L. *mobilē vulgus*, the fickle common people: comp. Gael. *mop* or *mob*, disorder, confusion; *mobainn*, to handle roughly]: a crowd or multitude of people rude and disorderly; a crowd; the populace: V. to attack in a disorderly crowd; to harass or overbear tumultuously. **MOB'-BING**, imp. **MOBBED**, pp. *mōbd*. **MOBBISH**, a. *mōb'bīsh*, done after the manner of a mob. **MOB-LAW**, a rough and off-hand way of administering justice undertaken by a mob.—**SYN.** of 'mob, n.': assemblage; assembly; multitude; throng; swarm.

MOB-CAP, n. *mōb-kăp'* [OE. *mobble*, to muffle up; O. Dut. *moppen*, to wrap up; *mop*, a woman's coif: Low Ger. *mopp*, a woman's cap]: a kind of female undress for the head, having a full round crown gathered into a band at the outer edge, usually made of clear muslin; a woman's night-cap.

MOBERLY, *mō'bér-lē*: city, Randolph co., Mo.; a railroad and manufacturing centre, 23 m. s. of Macon, 148 m. w. of St. Louis. It has 11 churches, a high school, one daily and two weekly newspapers, and two banks. Its manufactures include flour, tobacco, carriages, and various implements. There is also a planing mill, and a foundry; the shops of the Wabash Western r.r. are here, and there are machine shops for repair work of different kinds. Pop. (1880) 6,070; (1890) 8,215; (1900) 8,012.

MOBILE, a. *mō'bīl* [F. *mobile*, movable—from L. *mobilē*, easily moved, variable]: susceptible of motion; movable; fluid. In military affairs, especially in continental Europe, applied to an army in readiness to take the field (see **MOBILIZE**). **MOBILITY**, n. *mō-bīl'ī-tē*, capacity of being moved; fluidity; fickleness; the lower stratum or mob.

MOBILE, *mō-bēl'*: city, cap. of Mobile co., Ala., port of entry, and most important railroad and commercial centre in the state. It is on the M. river, near its union with the M. bay, 30 m. n. of Gulf of Mexico, 140 m. e. of New Orleans, 1,033 m. from Washington. It is about six m. long and extends two to three m. w. from the river, but the closely settled portion occupies only about one sq m bordering on the river. M. is on a sandy plain about 15 ft. higher than the river. Its wide and shaded streets are regularly laid out, lighted with gas and electricity, and many of them are well paved. An abundant supply of pure water is obtained from Spring Hill, five m. away, the works for which cost half a million dollars. E. and W. of the city are hills covered with pines which

MOBILE.

are popular resorts in the hot season, and upon which many beautiful summer residences have been erected. With the exception of occasional visits of yellow fever, which sanitary precautions are making less frequent, the location is healthful. M. is an important railroad centre, three trunk lines leading to the great cities of the s and w., two local lines, and the M. Jackson and Kansas City railroad, which will open an immense timber region, in process of construction 1890. The great coal fields and iron mines in the central part of the state also are reached by railroad, and there are steamer connections with Montgomery, the large sea-board cities and Liverpool. On account of the shallowness of the harbor large vessels were formerly compelled to remain in the bay about 25 m. from the wharves. The national govt. has appropriated \$250,000 to deepen the channel, and ships drawing $15\frac{1}{2}$ ft. of water were able to enter the harbor 1888. New wharves were built 1887 at a cost of \$240,000. M. is the natural shipping point of the largest cotton-growing section in the Union, and the outlet of 2,000 m. of navigable rivers which drain a rich agricultural, iron, and coal region. Previous to the civil war the annual average export of cotton was 632,308 bales. Export (1886-7), 216,142 bales. The annual timber shipments, foreign and coastwise, are about 30,000,000 ft., besides 150,000 to 200,000 pieces of white oak for wine barrel staves and 130,000,000 cypress shingles. Of the import trade coffee is the most important item. M. which, after the civil war until about 1880, had a season of depression and decline in population and trade, is now more than renewing its former prosperity. The manufacturing interests are increasing rapidly. They include cotton-mills, foundries, sash and door works, box and barrel shops, paper-mills, and 8 shingle mills. Market-gardening is an important interest, the value of its prod. 1883 amounting to \$700,000. M. has 34 churches, 4 orphan asylums, U. S. marine hospital; excellent schools, including a high school for colored children; academies. Jesuit college, state medical college; and 1902, Sept., 6 banks, including 2 national, capital \$500,000, 2 state, capital \$240,000, and 2 private banking concerns. There are 6 fire insurance companies which, according to latest accessible reports, have gross assets of \$1,109,776 and liabilities (incomplete) of \$199,719. There are 6 lines of street cars, and several newspapers. Among the fine buildings are the custom-house, in which the post-office is located: Rom. Cath. cathedral, Christ Church (Prot. Episc.), Odd-Fellows' hall, and the Battle House. Near the city is the African vill. where the survivors of the last slave ship which entered the port 1859 reside. M. was founded 1702 and was the cap. of La. till 1723, ceded to Great Britain 1763, captured by the Spanish 1780, retaken for La. 1813, and was incorporated a city 1819, with pop. 2,500. It was the scene of important military and naval operations in the civil war. Pop. (1860) 29,258; (1870) 32,034; (1880) 29,132; (1890) 31,076; (1900) 38,469.

MOBILE' POINT: end of a long narrow sand-strip in s.w. Ala. which separates Mobile Bay from the Gulf of Mexico on the s.: the Point is the e. extremity of the entrance to Mobile Bay, and is the site of Fort Morgan (q.v.). Fort Bowyer, a previous rude construction on the same site, was attacked by a British squadron of four vessels 1814, Sep. Its garrison of 130 men under Maj. Lawrence held the fort with a loss of 8 men: the British loss was 232 killed and wounded, and their flag-ship, which grounded and was burned. 1815, Feb., Fort Bowyer was captured by the British.

MOBILE' RIVER and BAY: river, and its estuary in s.w. Ala., discharging into the Gulf of Mexico.—The *River* is formed by the confluence of the Alabama and Tombigbee, 50 m. above Mobile, which lies at its mouth. It is a sluggish stream, with low banks and several channels. Six m. below the junction of the two rivers which form it, it divides into an e. branch (the Tensas river) and a w. branch (M. river). The M. is navigable for large steamboats throughout.—The *Bay* is 30 m. n. to s., and 10 or 12 m. e. to w. The entrance from the Gulf of Mexico, 3 m. wide, is defended by Fort Morgan and Fort Gaines.—M. Bay is a shallow sheet of water, 12 to 14 ft. deep. At its s.w. extremity is an outlet communicating with Mississippi Sound through Grant's Pass, giving inland navigation for light-draught steamers through Lake Ponchartrain to New Orleans. A plan for dredging a channel 23 ft. deep through the bay from the city of Mobile to the Gulf is now being carried out. Many small rivers empty into the bay from the n., and its margins are lined with thick groves of live oak and magnolia.

MOBILIER, CRÉDIT, *krā-dē' mō-bē-lyā'*: notable banking institution in France, sanctioned by the French government 1852, Nov. 18, under the name *Société Général de Crédit Mobilier*. The name was intended as a contrast to the *Sociétés de Crédit Foncier*, which are of the nature of land banks, and advance money on the security of real or *immovable* property; while the *Crédit Mobilier* proposed to give similar aid to the owners of *movable* property. The declared object of this bank is especially to promote industrial enterprises of all kinds, such as the construction of railways, sinking of mines, etc. Various privileges were conferred on it under its charter; in especial, it was allowed to acquire shares in public companies, and to pay the calls made upon it in respect of such shares, by its own notes or obligations; also to sell or give in security all shares thus acquired. The operations of the society were on a very extensive scale. In 1854, it subscribed largely to the govt. loan on account of the Russian war, to the Grand Central Railway Company, to the General Omnibus Company of Paris, and to various other important undertakings. The dividend for that year was 12 per cent. In 1855, it lent two sums to the govt.—one of 250, the other of 375 million francs. Its operations were vast during that

year, and the dividends declared amounted to 40 per cent. The directors had not hitherto availed themselves of their privilege of issuing their own obligations, but this they now resolved on doing. They proposed to issue two kinds—one at short dates; the other at long dates, and redeemable by instalments. The proposed issue was to amount to 240 millions of francs, but the public became alarmed at the prospect of so vast an issue of paper-money, so that, 1856, Mar., the French govt. deemed it necessary to prohibit the carrying out of the proposed scheme. This was a severe blow to the institution. In 1856, its dividends did not exceed 22 per cent.; in 1857, they were only 5 per cent. Several attempts had been made to resuscitate its credit, but failed. In 1875 it was put under a new board of management, who reported its assets at 77,000,000 francs. In 1878, the capital was reduced from 80 millions to 32, and in 1879, raised again to 40 millions. In 1872–79, the highest value reached by the shares was 390 francs (in 1874). The C. M. has undoubtedly been highly useful in the industrial development of France; but its operations have been hazardous, and except for the timely governmental check would probably have been disastrous.

MOBILIER', CREDIT' (of America): see CREDIT MOBILIER OF AMERICA.

MOBILIZE, v. *mōb'īl-īz* [F. *mobiliser*, to make movable—from L. *mobilis*, easily moved]: to call into active service, said of troops not previously on the war establishment. MOBILIZING, imp. MOBILIZED, pp. *mōb'īl-īz'd*. MOBILIZATION, n. *mōb'īl-ī-zā'shūn* [F.—L.]: the calling out and putting into a state of readiness for active service in the field troops not previously on the war establishment. The process consists in augmenting regiments from the peace to the war complement, in calling in men on furlough, in organizing the staff of divisions and brigades, constituting the commissariat, medical, artillery, and transport services, and in accumulating provisions and munitions. As the work of mobilizing an army causes enormous expense, it is resorted to only when hostilities appear imminent.

MOBLE, or MOBBLE, v. *mōb'l* [Dut. *moppen*, to wrap up (see MOB-CAP)]: in OE., to wrap up as in a hood. MOB'LING, imp. MOBBLED, pp. *mōb'ld*.

MOBOCRACY, n. *mōb-ōk'rā-sī* [Eng. *mob*, and Gr. *kratēō*, I rule]: the rule or ascendancy of the mob.

MOCCASIN, n. *mōk'ā-sīn* [Indian word]: a shoe or cover for the feet made of deerskin, but without a sole; the shoe worn by the American Indians. In the southern United States, an exceedingly poisonous water-serpent, called sometimes Water-moccasin (spelled also *Mocassin*), or Cotton-mouth (*Ancistrodon piscivorus*); about two ft. long; dark brown above, gray below. It frequents swamps and is prompt in attack.

MOCHA—MOCKING-BIRD.

MO'CHA: seaport, former cap. of Yemen, in Arabia; on the Red Sea, at the head of a little bay near the Strait of Bab-el-Mandeb, 130 m. w.n.w. of Aden (q.v.). All round the shore is a hot sandy waste. The principal trade is in coffee; but the eminence of M. as the shipping port for all the coffee of Yemen (M. not being itself in the coffee-growing country), has now been transferred to Aden. Other exports are dates, gums, balm, ivory, and senna. Pop. 5,000.

MOCHA, n. *mō'kǎ* [from *Mocha*, in Arabia]: a fine description of coffee. **MOCHA-STONE**, a white translucent variety of agate, containing brown markings resembling finely ramified vegetable filaments or mosses—named from the fact that when they first became known in Europe, they were brought from Mocha. Of the same nature with Mocha-stones are *Moss Agates*. The resemblance of the inclosed infiltrations to plants is often merely accidental, but it appears to be some times really due to plants, which were inclosed in the cavity in which the silicious mineral itself was formed.

MOCK, v. *mōk* [Ger. *mucken*, to make mouths at one: O. Dut. *mocken*, to mumble: Sp. *mueca*, a grimace: It. *mocca*, a mocking mouth: Gr. *mōkōs*, mockery: OF. *mocquer*; F. *se moquer*, to mock]: to laugh at; to deride; to mimic in contempt; to subject to unnecessary disappointment; to fool; to tantalize; to make contemptuous sport of: **ADJ.** assumed; not real; false: **N.** any act of contempt or derision; a sneer; insult. **MOCK'ING**, imp.: **ADJ.** imitating in contempt or ridicule; treating with sneers: **N.** derision; insult. **MOCKED**, pp. *mōkt*. **MOCKER**, n. *mōk'ēr*, one who mocks; a scoffer; a deceiver. **MOCK'ERY**, n. *-ēr-ī*, the act of deriding and exposing to contempt by imitation or mimicry; derision; sportive insult or contempt; false show; imitation; subject of laughter or derision; vain effort. **MOCK'INGLY**, ad. *-lī*. **MOCKING-BIRD**: see below. **MOCK-LEAD** or **-ORE**, a sulphuret of zinc. **MOCK-SUN**, n. a Parhelion (q.v.). **MOCK-TURTLE**, a soup in imitation of turtle-soup, made of calf's-head, and often of pig's-head or cow's-head and feet. **TO MAKE A MOCK OF**, to turn any person or thing into ridicule.—**SYN.** of 'mock, v.': to ridicule; taunt; laugh at; mimic; sneer at; jeer; gibe; disappoint; in *OE.*, defeat; elude.

MOCKADO, n. *mōk'a-dō* [from *mock*]: a fabric made in imitation of velvet; mock-velvet, made specially in Queen Elizabeth's time: mockery.

MOCK'ING-BIRD, or **MOCK'ING-THRUSH** (*Mimus*): genus of birds of family *Merulidæ*, having a more elongated form than the true thrushes, a longer tail, shorter wings, and the upper mandible more curved at the tip. They all are American, forming a group often placed among the Thrushes (*Turdidæ*). The best-known species, the M. of the United States (*M. polyglottus*), is about the size of the song-thrush; the upper parts of a dark brownish ash color, the wings and tail nearly black, the under

MOCKING-BIRD.

parts brownish white. The M. is common in almost all parts of America, from the south of New England to Brazil; n. of the Delaware, it is only a summer visitant, but in more southern regions it is found at all seasons. It is one of the most common birds of the W. Indies, and its exquisite song fills their groves with melody by night, for which reason it is there very generally known as the Nightingale. By day, the M. is generally imitative, excelling all birds in its power of imitation, taking up the song now of one bird, now of another, and often deceiving the most practiced ear by its perfect performance. By night, its song is usually natural. It does not confine itself to musical strains; it seems to take equal pleasure in repeating



Mocking-bird (*Mimus polyglottus*).

the harshest cries of the feathered tribes; and in domestication readily adds to its accomplishments the imitation of almost any sound which it is accustomed to hear, passing from one to another with great rapidity, so as to produce an incomparable medley. The M. readily learns to whistle a tune, even of considerable length, but there is no well-authenticated instance of its imitating the human voice. The barking of a dog, the mewing of a cat, the crowing of a cock, the cackling of a hen, the creaking of a wheelbarrow, all are within the compass of its powers. During its performances, it spreads its wings, expands its tail, and throws itself about, as if full of enthusiasm and enjoyment. The M. is vocal at all seasons of the year. Two or three broods are produced in a year. The male is extremely attentive to his mate, and manifests extraordinary courage in driving away enemies from the nest. Mocking-birds often assemble on such occasions, and birds of prey, far superior to them in size and strength, are compelled to retreat. Snakes are killed by reiterated blows on the head, and cats learn to consider the vicinity of a mocking-bird's nest unsafe. The food of the M. consists chiefly of berries and insects. Another species of M. is found in the Rocky Mountains, and species of the same genus are among the finest song-birds of the temperate parts of S. America.

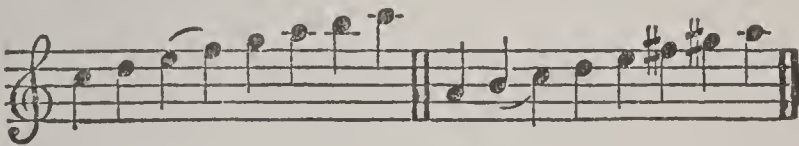
MOCO—MODE.

MOCO, n. *mō'kō*: a S. Amer. animal, allied to the guinea-pig, but larger.

MODAL, a. *mō'dāl* [It. and F. *modale*—from L. *modus*, measure, method: Sp. *modal*, modal]: relating to form or mode; having the form without the essence or reality. **MO'DALIST**, n. *-īst*, in *theol.*, one who views the Father, Son, and Holy Spirit as modes of being, and not as having distinct personality. **MO'DALLY**, ad. *-lī*. **MODALITY**, n. *mō-dāl'ī-tī* [F. *modalité*]: the quality of being in form only; in *logic*, a term employed to designate propositions in which the copula is accompanied by some phrase which adds to or restricts its meaning. **MO'DAL-PROPOSITION**, in *logic*, a proposition which affirms or denies with a qualification or limitation.

MODE, n. *mōd* [F. *mode*—from L. *modus*, measure, manner, method: It. *modo*; Gael. *modh*, manner, method: Icel. *mot*, type]: manner of existing or being; in *metaph.*, that which cannot subsist in and of itself; manner; fashion; custom; usual way or course; in *music*, the peculiar melody of the octave in its divisions, as the minor *mode*, the major *mode*. **THE MODE**, the prevailing fashion or custom.—**SYN.**: accident; gradation; degree; manner; method; form; state.

MODE, in Music: the peculiar melody of the octave in its divisions. Every musical passage is referrible to and forms part of a succession of sounds having some appreciable relation to one another. This succession of sounds is called the scale, and is a series of steps leading from a given note called the Key-note, or Tonic (q.v.), to its octave. The steps or degrees of the scale are of unequal size, and on the place of the smaller ones or semitones depends the *mode* of the music. Taking our



Major Mode.

Minor Mode.

natural scale, there are only two notes in it which can satisfy the ear as key-notes—viz., C and A. In the major mode, with C as key-note, the semitone or small interval falls between the third and fourth sounds; in the minor mode, with A as key-note, it falls between the second and third sounds; in the former case, the third of the key-note is a major third, in the latter a minor third. The minor mode further requires to be modified by occasionally sharpening its sixth and seventh, in order to be pleasing to modern ears. The scale of the major mode is derived from simpler harmonic proportions than that of the minor. Melodies composed in the latter mode have generally more or less of a plaintive or melancholy character. For the theory of these modes, see **MUSIC**. Ancient musicians admitted of a greater variety of modes. The Greeks had six, designated the Dorian, Phrygian,

Lydian, Mixo-Lydian, Ionic, and Æolian. The Ionic is the modern major, the Æolian the minor mode; the others are more or less intolerable to a modern ear. They are used to a limited extent in the music of the Greek Church, and in the Ambrosian Chant.—Mode is used more rarely to signify *key*.

MODEL, n. *mōd'él* [OF. *modelle*; F. *modèle*—from It. *modello*, a model, a frame—from L. *modŭlus*, a size or measure of a small thing—from L. *modus*, a measure]: a pattern of something to be made; a pattern in miniature; any object which an artist proposes to imitate; a copy or object for imitation; a mold; a copy or representation; that by which anything is measured or formed: V. to shape; to make a pattern or copy of in some plastic substance. **MOD'ELLING**, imp.: N. the art of constructing representations of things in clay or other plastic materials, as a pattern for a work of art, or as a mold for reproductions. **MOD'ELLED**, pp. -*ēld*: **ADJ.** shaped; formed. **MOD'ELLER**, n. -*ēr*, one who practices modelling; a molder or designer in clay, plaster, or wax.

MOD'ELLING: art and process of preparing the original pattern or design from which a work in sculpture is to be cast or carved: for the technical details, see **SCULPTURE**. M. is practiced by medallists also; the head or figure intended to be cut in the die being first modelled in relief with wax on a piece of slate. Goldsmiths, silversmiths, and jewellers also model intricate and artistic forms and ornaments of pieces of plate, to be cast and chased by them, or in which jewels are to be set. Wax is the substance used when delicacy and minuteness are required. M. is a branch of the potter's trade also. Flaxman modelled for Wedgwood numerous figures and groups in wax. For large models, the material employed is potter's clay, which, when used by sculptors, is mixed with a portion of sandstone, finely pulverized, to make it work freely.

MODENA, *mōd'ā-nā* or *mōd'ēn-ā*: modern province of Italy, comprising part of the anc. duchy of M. which lay between the Po and the Mediterranean. The duchy shared the various vicissitudes which befell Italy, and participated in the great internecine feuds of the country. In 960, a member of the great House of Este was proclaimed Marquis of M.; and 1452 the then reigning marquis was created duke by Emperor Frederick III. In 1796, M. formed part of the Cisalpine Republic, but was restored 1814 by the Congress of Vienna to the reigning family. The duchy had at that time 2,310 sq. m.; pop. 586,000. In 1048, the Duke of M. was temporarily deprived of his rights; and 1860, the people definitively expelled their unpopular ruler, who carried off all the property and valuables within his reach, including the silver handles of the palace doors. The present province of M. has 960 sq. m.; pop. (1881) 279,405; (1889) 303,541; (1901) 315,804.

MODENA—MODERATE.

MODENA (anc. *Mutina*): fortified city of n. Italy, cap. of the former duchy of M.; 24 m. w.n.w. of Bologna. It stands between the rivers Secchia and Panaro, in a pleasant plain, noted for rich soil and salubrious air, and from its surrounding ramparts commands fine views of the Apennines. Although the social life of M. is somewhat stagnant, it is nevertheless an agreeable city. It lies on the famous Via Æmilia (see **EMILIAN PROVINCES**), by which it is divided into the old and new city, and is connected by a navigable canal with the rivers Secchia and Panaro. Among public buildings, may be noted the cathedral of St. Geminianus, patron of the city, a structure of the purely Lombard style. The campanile or belfry is one of the great towers of Italy; it is a square turreted structure, 315 ft. in height, its entire façade being in white marble. The ducal palace, a picturesque structure of the 17th c., is adorned with innumerable galleries, courts, and marble arches; it contains the splendid Biblioteca Estense, numbering 100,000 vols., and 3,000 rare mss.; also the valuable Este archives, a most important collection of mediæval records, collections of coins and medals of great antiquity, and an observatory. Schools of theology, law, medicine, and mathematics have replaced the university, suppressed 1821; there are also fine museums of nat. history, a botanic garden, theatres, and good public baths. The trade of M. is unimportant: the manufactured products are confined to linen and woolen fabrics, leather, hats, paper, glass, and pottery, besides silk manufactured to a much less extent than formerly.—The ancient history of M. evidences its prosperity at an early period; the splendor, wealth, and arts of the city being mentioned by Cicero, Pliny, and Strabo.—Pop. commune (1901) 64,843.

MODERATE, a. *mōd'ēr-āt* [L. *modērātus*, kept within limits or bounds, temperate—from *modus*, measure, mean: It. *moderato*; F. *modéré*, moderate]: temperate; observing reasonable bounds, as in the indulgence of the appetites, in expressing opinions, etc.; not excessive, as in price or value; not extreme, as in opinions; not great; medium: V. to restrain from excess of any kind; to regulate; to reduce or lessen in violence or intensity; to allay; to pacify; to become less violent or intense. **MOD'ERATING**, imp. **MOD'ERATED**, pp. **MOD'ERATELY**, ad. *-lī*. **MOD'ERATENESS**, n. *-nēs*, state of being moderate; a mean or middle state. **MOD'ERATES**, n. plu. *-ātz*, in *Scot. eccles. hist.*, the Broad Church party in the Kirk of Scotland, who inculcated a wide toleration in ecclesiastical matters, as distinguished from the Evangelical party, who inculcated a narrow and literal adherence to the Kirk's standards. **MOD'ERATOR**, n. *-ā-tēr*, a president or chairman; in *Presb. churches*, the chairman of any church court; in some other denominations, the chairman of various councils and conferences; that which regulates. **MOD'ERA'TORSHIP**, n. *-shīp*, the office of a moderator. **MOD'ERA'TION**, n. *-ā'shūn* [F.—L.]; state of

MODERN—MODICA.

being moderate; restraint in indulgence; temperance; calmness of mind; equanimity; forbearance. MODERATIONS, n. plu. a certain examination of students at Oxford. MOD'ERA'TO, ad. -á'tō [It.]: in *music*, denoting a movement between andante and allegro; moderately. TO MODERATE IN A CALL, among *Scot. Presbyterians*, to take the proper ecclesiastical legal steps on the part of a presbytery to induct a minister into a church, in order to give effect to the formally expressed wishes of the congregation.—SYN. of 'moderate, v.': to regulate; mitigate; qualify; temper; appease; pacify; quiet; abate; lessen; allay; repress; still; restrain.

MODERN, a. mōd'ērñ [F. *moderne*, modern—from mid. L. *modernus*, of the present mode or fashion, modern—from L. *modo*, just now, of late: It. and Sp. *moderno*, late, recent]: pertaining to the present, or time not long past; late; recent; not ancient: N. one of modern times, as opposed to one of ancient times, used in plu. MOD'ERNNESS, n. -nēs, the state of being modern. MOD'ERNIZE, v. -īz, to render modern; to give a modern form to. MOD'ERNIZING, imp. MOD'ERNIZED, pp. -īzd, rendered suitable for modern usage or style. MOD'ERNIZER, n. -ī-zēr, one who renders modern. MOD'ERNIZATION, n. -ī-zā'shŭn, the rendering conformable to modern usage that which is ancient or antiquated. MOD'ERNISM, n. -īzm, modern practice; something recently formed, as in language; something whose origin is not remote. MOD'ERNIST, n. -īst, an admirer of the moderns. MODERN EPOCH, in *geol.*, the existing period, embracing all formations which owe their origin to causes now in action.—SYN. of 'modern, a.': new; novel; present; fresh; common.

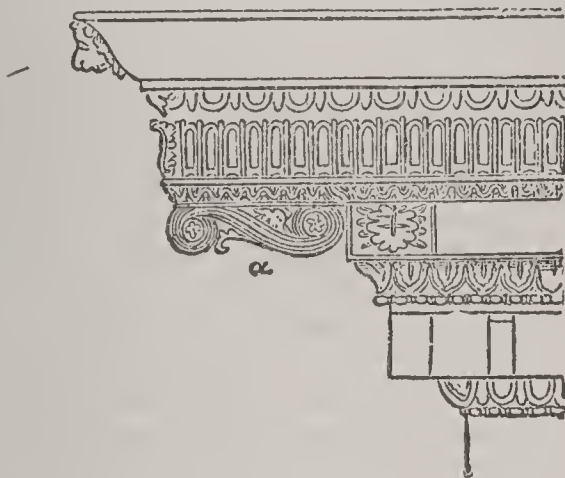
MODEST, a. mōd'ĕst [F. *modeste*—from L. *modestus*, that keeps within due bounds—from *modus*, measure, limit: It. *modesto*]: restrained by a due sense of propriety; not forward or bold; unobtrusive; diffident; becoming; not excessive; reasonable; not lewd; chaste. MOD'ESTLY, ad. -lī. MOD'ESTY, n. -ĕs-tī [F. *modestie*—from L. *modestīa*]: the lowly estimation of one's own merits, importance, or powers; unassuming conduct; propriety of manner or behavior; decency; decorum; chastity.—SYN. of 'modest': bashful; reserved; decent; shy; coy; virtuous; moderate; humble.

MODICA, mōd'ē-kā (*Mohac* of the Saracens): city of the island of Sicily, province of Val di Nota, 30 m. from Syracuse. The city, perched amid rocks, contains several fine buildings, and, notwithstanding the humidity of the climate, the sanitary condition seems satisfactory. The soil of the surrounding district is the most productive of Sicily, and yields vast quantities of corn, tobacco, oil, wine, hemp, which, with cheese, wool, soda, and butter, form the chief export trade of the place. The valley of Ipsica, or Ispica, in the vicinity of M., contains remarkable rocks, in which numerous dwellings are excavated.—Pop. of M. (1881) 37,919.

MODICUM, n. *mōd'ī-kūm* [L. *modicus*, small, not large—from *modus*, measure]: a little; a small quantity.

MODIFY, v. *mōd'ī-fī* [F. *modifier*—from L. *modificāre*, to measure, to restrict, to modify—from *modus*, measure, limit; *fīō*, I become: It. *modificare*]: to change slightly, as in the form or in the external qualities of a thing; to reshape; to vary; to moderate; to lower, as sound. **MODIFYING**, imp.: **ADJ.** changing the form or external qualities: **N.** the act of slightly changing. **MODIFIED**, pp. *-fīd*: **ADJ.** slightly changed; qualified in certain parts. **MODIFIER**, n. *-fī-ēr*, one who or that which modifies. **MODIFIABLE**, a. *-fī'ā-bl*, that may be slightly changed or altered in external appearance or in qualities. **MODIFIABILITY**, n. *-fī'ā-bil'ī-tī*, capability of being modified. **MODIFICATION**, n. *mōd'ī-fī-kā'shūn* [F.—L.]: the act of modifying; a slight change in form; any particular form or manner.

MODILLION, n. *mō-dīl'yūn* [F. *modillon*—from L. *modūlus*, a measure]: in *arch.*, ornamental bracket (*a* in fig.), much used in classic architecture, especially at



Modillion.

regular intervals under the cornices of Corinthian and Composite entablatures.

MODIOLA, n. *mō-dī'ō-lā* [L. *modiōlus*, a small corn-measure—from *modiūs*, a Roman dry measure, a peck]: a genus of bivalves, living and fossil, distinguished from the mussels by their habit of burrowing or spinning a nest, so called in reference to the shape of the shell, which is oblong and inflated in front.

MODIOLUS, n. *mō-dī'ō-lūs* [L. *modiōlus*, the nave of a wheel—from *modiūs*, a measure]: in *anat.*, the central axis or pillar of the internal ear, conical in form, and extending from the base to the apex of the cochlea.

MODISH, a. *mō'dīsh* [F. *mode*, manner—from L. *modus*, a measure, manner (see **MODE**)]: according to the mode or customary manner; in the mode; fashionable. **MODISHLY**, ad. *-lī*. **MODISHNESS**, n. *-nēs*, state or quality of being modish or fashionable. **MODIST**, n. *mō'dīst*, a follower of the fashion. **MODISTE**, n. *mō-dēst'* [F.]: a woman who deals in articles of fashion, particularly in dress; a woman who makes ladies' dresses in the style and mode of fashion; a dressmaker.

MODJESKA—MODOCS.

MODJESKA, *mōd-jēs'ka*, **HELENA**: actress: b. 1844, Oct. 12, Cracow, Poland. Her father, Michael Opido, a noted musician, educated her in literature and art, but her taste for the stage was repressed until her marriage, 1860, to G. S. Modrzejewski (altered in England to Modjeska). Her first amateur acting, at Bochnia, Aust. Poland, 1861, led her husband to form a company, with which she played in the towns of Galicia; and at Lemberg for three months, 1862. She had a theatre of her own in Czernowice; and, 1865, became leading lady in the Cracow theatre, and attained wide fame. Her attachment to the Polish stage caused her to refuse flattering offers elsewhere. After her husband's death, and her second marriage, to Charles Bozenta Chlapowski, 1868, Sep., she settled, 1869, in Warsaw, and during seven years there acted in plays of Shakspeare, Goethe, Schiller, and Molière. Removal to California, near Los Angeles, 1876, led to her studying English 1877, and entering on a period of remarkable success in Amer. and England. Madame Bozenta's husband is an Amer. citizen by naturalization.

MODOCS, *mō'doks*: tribe of Amer. Indians, originally located on a district, of abt. 4,000 sq. m., s. of Lake Klamath, Cal. In origin they were of the Klamath nation, which was seated, in three tribes, in n.w. California and over the Oregon line, along the Klamath river, from its mouth at the Pacific to its springs near the s. end of Lake Klamath. The Euroc, or down, tribe, dwelt next the Pacific; and on the upper river the Cahroc tribe. Beyond these were the Moadocs or Modocs, the name meaning 'head of the river.' As an outlying and inferior tribe, they became hostile to the Klamaths below them, and waged war with them and with the Shastecas, trading in slave captives. Though decently clad in skins, and having for houses pits roofed with slabs and a covering of earth, they were most inferior to the Cahrocs, having heavy drowsy faces and dull yellowish eyes, with very dark skin. The whites had experience of their savage character in 1847, 49, and 50. In the last case Capt. Nathaniel Lyon chastized them at Clear Lake, and after the next trouble, a massacre of whites, 1852, Ben Wright invited them to a feast, 1855, and slaughtered 41 of the 46 who came; an act of revenge by treachery which the tribe never forgave. Gen. Crosby's campaign 1856 destroyed many of them, but the war went on to 1864, Oct. 15, when a treaty was made, under which the Modocs and Klamaths ceded all their lands except a mountainous reservation of 1,200 sq. m. on Klamath Lake. This was Klamath territory, and putting Modocs on it made trouble and led to the Modoc war. Capt. Jack (Krentpoos) led off a wild band to an old home of the M. on Lost river, where their operations raised such complaint as to bring out an order for their forcible return to the reservation. A force from Fort Klamath attacked Capt. Jack's camp with loss 1872, Nov. 29; and an Oregon force had the

MODULATE—MODULE.

same experience with another camp across the Klamath river. The two camps retreated together, massacring whites on the way, and found a natural fortress in the lava beds s. of Lake Clear. Maj.gen. Wheaton advanced on them, 1873, but was checked three m. from their stronghold, with 12 men killed and 21 wounded. A second attempt by Gen. Gillem was no more successful. A third by the govt. commissioners resulted, 1873, April 11, in the treacherous killing of Gen. Canby and Dr. Thomas, two of the commissioners, and the wounding of a third, Mr. Meacham. June 1 the stubborn resistance of the savages ended with their surrender to Gen. J. C. Davis. Capt. Jack, and three others, were tried and hung, Oct. 3, and the band of 148 sent to the Indian Territory.

MODULATE, v. *mōd'ū-lāt* [L. *modŭlātŭs*, brought within the rules of rhythm or harmony, musical—from *modus*, measure: It. *modulare*: F. *moduler*]: generally, to proportion parts to each other; to vary the voice or musical sounds in a natural and pleasing manner; to vary or inflect the pitch of the voice, in reading or speaking, in a pleasing manner; in *music*, to change the key or mode. MOD'ULATING, imp. MOD'ULATED, pp.: ADJ. varied; inflected; formed to a certain key. MOD'ULATOR, n. *-lā-tēr*, that which modulates. MOD'ULA'TION, n. *-lā'-shŭn* [F.—L.]: the act of varying or inflecting the pitch of the voice in speaking or reading, in a pleasing manner; that which is modulated. In *music*, the act of conducting the air and the harmony through the requisite keys and modes in a manner agreeable to the ear; the change from a major into the relative minor key, or *vice versâ*. When in the course of a melody the key-note is changed, and the original scale altered by the introduction of a new sharp or flat, such change is called modulation. Much of the pleasure of music is derived from a judicious use of modulation. The art of good modulation from one key to another consists in the proper choice of intermediate chords. Sudden transitions, without intermediate chords, should be employed only sparingly and in peculiar circumstances. Every piece of music is composed in a particular key, in which it begins and ends, which generally predominates over any other keys introduced in the course of the composition.

MODULE, n. *mōd'ūl* [F. *module*, measure—from L. *modŭlŭs*, a small measure—from *modus*, measure]: in *classic arch.*, arbitrary measure or standard taken to regulate the proportions of columns or the symmetry of the whole building. The diameter, semi-diameter, or one-third of the diameter of the base of the shaft of a column are most frequently used; the first being usually divided into 60 parts (or minutes), the second into 30 parts, the third into 20 parts.

MODULUS—MÖEN.

MODULUS, n. *mōd'ū-lūs* [L. *mōdūlus*, a small measure—from *modus*, measure]: in *math.*, the constant coefficient or multiplier in a function of a variable quantity, by means of which one series or system of quantities can be reduced to another similar series or system. Thus we have the modulus of Elasticity (q.v.), of Friction (q.v.), and of systems of Logarithms (q.v.). The system of logarithms which is universally accepted as the primary is Napier's, and from it all other systems are deduced in the following manner: Let N be a number of which the Napierian logarithm is b , e being the Napierian base, it is required to find the logarithm of N to some other base a . Let x be this logarithm, then (see LOGARITHMS) $N = e^b = a^x$, and taking the Napierian logarithms of both sides of this equation, $b \log. e = x \log. ea$, or (since $\log. ee = 1$) $b = x \log. ea$, therefore $x = \frac{b}{\log. ea}$;

i.e., $\log. a N = \frac{\log. e N}{\log. ea} = \frac{1}{\log. ea} \times \log. e N$. This multiplier,

or 'modulus,' $\frac{1}{\log. ea}$, is independent of N , and is therefore constant for the reduction of all Napierian logarithms to the system whose base is a . If $a = 10$, the multiplier becomes $\frac{1}{\log. e 10}$, the modulus of Briggs's, or the common system of logarithms, and is equal to $\frac{1}{2.30258509} = .4342944....$

MODUS, n. *mō'dūs* [L. *modus*, a measure]: mode or manner: in *English law*, a compensation given in lieu of tithes. **MODUS OPERANDI**, *ōp'ér-ān'dī* [L. *operandum*, working—from *opus*, work]: the method of working; manner of operating; the way in which a thing is to be done.

MODWALL, n. *mōd'wāl*: a bird that feeds on bees; the merops. *Note*.—This word has been connected with Eng. *mead*, in the sense of honey.

MOE: see Mo.

MOELLON, n. *mō'ēl-on* [F.]: rubble-stone filled in between the facing walls of a structure, or between the spandrels of a bridge.

MÖEN, *mō'én*: Danish island in the Baltic Sea, separated from Seeland on the n.w. by the *Ulfsund*, and from Falster on the s.w. by the *Grönsund*. It is 19 m. long, by about 5 m. in average breadth; 84 sq. m. The people are supported by agriculture, fisheries, and commerce. It has been called the Switzerland of Denmark, and is remarkable for the irregularity of its surface. The soil is fruitful. Its chief town and seaport is Stege—pop. (1880) 1,930.—Pop. of island, about 15,000.

MÆRIS, LAKE, *mē'ris*: ancient name of a sheet of water in Egypt, now known as *Birket-el-Kerūn* or *El-Korn* ('Lake of the Promontory'); in the province of Fayūm, about 50 m. s.w. of Cairo; extreme length n.e. to s.w., 30 m.; breadth, 6 m.: it was formerly much larger. Its average depth is 12 ft., and its greatest ascertained depth 28 ft. On the n. and w., its shores are rocky, but on the s., flat and sandy. It is connected with the Nile by a canal, *Bahr-Jusuf* ('River of Joseph'). The waters are brackish, being impregnated with the alkaline salts of the desert and with the muriate-of-lime depositions of the surrounding hills. In the time of the Pharaohs, the revenue from the fisheries was applied to the maintenance of the queen's wardrobe and perfumes. Under the Persians, the fisheries were let (during the season of the inundations, at a sum equivalent to \$750 a day. At present they yield but little more than \$400 a year.

MÆSIA, *mē'shī-a*: ancient Roman province, bounded by the Danube on the n., the Black Sea on the e., the mountain-chains of *Hæmus* (Balkan) and *Orbelus* on the s., that of *Scardus* and the rivers *Drinus* (Drina) and *Savus* (Sava) on the w. The river *Ciabrus* (Cibriz) divided it into two parts, of which the Eastern (*Mæsia Inferior*) is the present Bulgaria, and the Western (*Mæsia Superior*) is Servia. Its original inhabitants were mostly of Thracian race. Gaulish or Celtic invaders settled in W. Mæsia about B.C. 277, under the name of *Scordisci*. The Romans came in contact with the tribes of M. first after the conquest of Macedonia, when C. Scribonius Curio forced his way as far n. as the Danube, and gained a victory over the Mæsians (B.C. 75); but the country was not completely subjugated till B.C. 29. It was made a Roman province in the reign of Augustus, prob. abt. B.C. 16, and flourished for more than two centuries; but as a frontier province it was exposed to hostile invasions, and required a line of fortresses and stations all along the s. bank of the Danube. In A.D. 250, the Goths made an irruption into the country, and defeated and slew the Roman emperor, Decius. At last, about the end of the 4th c., M. was given up to them (known afterward as Mæso-Goths) by Emperor Theodosius I. Slavonian tribes settled in M. in the 6th and 7th centuries.

MÆSO-GOTHS, n. *mē'zō-gōths* [from Mæsia—q.v.]: later name of the Goths who in the 3d c. settled in Lower Mæsia, at the mouth of the Danube. Ulfilas (q.v.) was a Mæso-Goth. The name, however, became of more general use to designate those who remained in Mæsia after the great migration in the beginning of the 5th century. **MÆSO-GOTHIC**, n. language of the Mæso-Goths: **TEDJ.** of or pertaining to. **MÆSO-GOTHIC GOSPELS**: see **ULFILAS**. {

MOFFAT, *mōf'at*: market-town and favorite watering-place of Scotland, county of Dumfries; in the upper part of the broad and beautiful valley of the Annan, surrounded by hills of moderate elevation, 19 m. n.n.e. of Dumfries. A short railway to connect M. with the main

MOFFAT.

Caledonian line was opened 1883. Among the public edifices are the baths and the reading and assembly rooms. The mineral springs, the principal of which, like that of Harrogate, is saline and sulphurous, are quite famous; but perhaps the greatest attractions of the place are its salubrious air and exquisite environs. Northward are the Moffat Hills; highest summit, Hartfell, 2,650 ft. During the season, the town is increased in population by from 800 to 1,000 visitors, to suit whose convenience great numbers of elegant villas, commanding fine views of the neighboring country, have been erected.—See *Black's Guide to M.*—Pop. (1881) 2,161; (1891) 2,290.

MOFFAT, ROBERT, D.D.: Christian missionary: 1795, Dec. 21—1833, Aug. 9; b. Ormiston, East Lothian, Scotland; of humble parentage. Having resolved to become a missionary to the heathen, he offered his services 1814 to the London Missionary Soc. (see MISSIONS, CHRISTIAN), and was sent by them 1816 to s. Africa. Arriving at Cape Town 1817, he immediately proceeded beyond the boundaries of Cape Colony to Namaqualand, where he entered on his labors at the kraal of Africaner, a powerful chief whose name had long been a terror to the people of the neighboring districts of the colony, for his audacious raids among their settlements, and for his ferocious character, but who, under M.'s influence, became a convert to Christianity. Here M.'s efforts had great success, Christianity and civilization advancing together. But the situation, on account of the drought and sterility of the country, and its very thinly scattered population, was unsuitable for a principal and permanent mission-station. M. returned to Cape Town 1819, where he married an excellent and heroic woman, to whom he had become engaged in England—his untiring helper for 50 years; and 1820 they went to Griqua Town, and ultimately to Kuruman, among the Bechuanas, w. of the Vaal river. Here he labored devotedly till the infirmities of age compelled his return to his native country 1870. He had an intermission of a few years in Britain, ending 1842. Wherever he went, the gospel was gladly received by some of those who heard it, and in some places by many. Alone, he translated the whole Bible into Bechuanan—creating a written language. In every place he guided the people also in the arts of civilized life. He made frequent and extended missionary tours, in which his adventures were very remarkable, and are graphically described in his work, *Missionary Labors and Scenes in Southern Africa* (Lond. 1842). His daughter became the wife of the African missionary explorer, Dr. Livingstone, who was largely influenced by M. in choosing his life-work. In 1873, he was presented with a testimonial of £5,800 in recognition of his great services in Christianizing and civilizing the savage tribes from Kuruman almost to the Zambesi. He lectured on African missions in Westminster Abbey 1875; and 1881 the Lord Mayor of London held a banquet in his honor. He died at Leigh, near Tunbridge Wells.

MOFUSSIL—MOGUER.

MOFUSSIL, *mō-fūs'sīl* [from Arabic word meaning 'separate']: term commonly used by Anglo-Indians for the rural part of a district as opposed to the administrative headquarters. Thus in Bengal the M. means practically the whole province beyond the city of Calcutta.

MOGADOR, *mög-a-dōr'*, or **SUEIRA**, or **SUEIRAH**, *swē'râ*: fortified town and seaport, cap. of the province of Hala; 130 m. w.s.w. of the city of Morocco. It stands on a rocky promontory, opposite a small island which forms the harbor, and is said to be the best-built town in the kingdom of Morocco. Though the harbor has a sheltered appearance, it is very dangerous in w. and s.w. winds. The streets are regular, though narrow; and the town consists of two parts, each surrounded by water. The quarter called the Fortress contains the custom-house and the treasury, and is the residence of the pasha, the vice-consuls, and the Christian merchants. The town is defended by four batteries on the island, and by a fort on the land-side; the walls also are defensible. M. is the seat of considerable trade; it exports olive-oil, wool, gum, hides, feathers, gold-dust, and almonds. Commerce is mainly in the hands of the Jews. The chief imports are woollens, cottons, and hardware. The total imports have annual value between \$1,000,000 and \$1,500,000; exports have about the same value. The climate is remarkably equable. Pop. about 20,000.

MOGAR, n. [native W. Indian]: the dried stick of the sugar-cane.

MOGRABIAN, a. *mō-grā'bī-an* [Ar. and Turk. *moghreb*, the west, n.w. Africa]: of or pertaining to north or northwest Africa: N. a native or inhabitant of north or northwest Africa.

MOGUER, *mō-gär'* [Ar. 'caves,' of which there are many in the neighborhood]: town of Spain, province of Huelva, 43 m. w.s.w. of Seville, rising gently above the Rio Tinto, near the mouth of which is its port, Palos. The streets are generally broad and straight, but both the town and castle are dilapidated. The old Franciscan convent was ordered 1846 to be preserved as a national memorial, but it is now fast going to ruin, and the wood of the cells stripped off. Here, 1484, Columbus, craving charity, was received by the prior, Juan Perez de Marchena, by whose influence he was enabled to prosecute his discoveries, setting out from the port of Palos 1492, Aug. 3. To this port also he returned 1493, Mar. 15, after having accomplished the great end of his expedition. Here likewise did Cortes land 1528, May, after the conquest of Mexico, and lodged in the same convent which gave shelter to Columbus. Palos is now a poor decayed fishing-port. M. has some trade in wine and fruit. Pop. abt. 8,350.

MOGUL—MOHAMMED.

MOGUL, n. *mō-gŭl'*, or **GREAT MOGUL** [Pers. and Ar. *mughal*, a native of Tartary]: popular designation of the emperor of Delhi, as the impersonation of the powerful empire established in Hindustan by the Monguls (q.v.), who were called *Moguls* by the Persians. The first Great Mogul was Baber, great-grandson of Timŭr, who founded the Mongul empire in Hindustan 1526. In 1803, the Great Mogul was deprived of his throne; 1827 he lost even the appearance of authority, becoming a mere pensioner of the British; and 1858 Mohammed Bahadŭr, last of the dynasty, was transported for complicity in the Indian mutiny. (The true spelling is *Mughal*.)

MOGUNTINE, a. *mō-gŭn'tin* [L. *Moguntia*, *Moguntiacum*, ancient name of the town]: of or pertaining to Mainz, in Germany.

MOHACS, *mō-hatch'*: market-town of Hungary, 110 m. s.s.w. of Pesth, on the w. arm of the Danube. It contains a gymnasium, has an important cattle-market, is a station for steam-boats on the Danube, and the seat of considerable trade in wine, coal, timber, and agricultural produce. Pop. (1890) 14,403. It owes its historical importance to the great battle here, 1526, Aug. 29, between Lewis II. of Hungary, with 25,000 Hungarians, and the Sultan Soliman, at the head of about 200,000 Turks. The battle resulted in the disastrous defeat of the Hungarians, who lost their king, 7 bishops, many nobles and dignitaries, and more than 22,000 men. A second battle was fought here, 1687, Aug. 12, when the Turks in their turn were defeated by an Austro-Hungarian army under Charles of Lorraine. These two battles mark the beginning and end of Turkish dominion in Hungary.

MOHAIR, n. *mō'hār* [said to be from Ar. *mokhayyar*, a kind of hair-cloth: Ger. *mohr*; F. *moire*; OF. *mouaire*]: a sort of camlet; the fine, soft, silky, long, pure white wool or hair of the Angora goat, native of Asia Minor; also the cloth made of its wool. Each animal yields 2 to 4 lbs. of wool at the annual clip, Apr. or May; and the exportation in recent years has grown very large: see **GOAT: ANGORA: WOOLEN MANUFACTURE**.—The Angora goat has not been acclimatized in Europe; but in 1849, and at various times since, flocks have been introduced into the United States—Va. and other southern states, and Or., Cal., and some other western states. In these high regions, with dry air, the flocks thrive and are now numerous.—M. is also a general term for cloth made of hair: spelled also **MOIRE**, which see.

MOHAMMED, n. *mō-hām'ed* [Ar. *muhammad*, praise-worthy—from *hamd*, praise]: founder of the Mohammedan religion (see below). **MOHAMMEDAN**, a. *mō-hām'ē-dān*, of or relating to Mohammed or to his religion: N. a believer in Mohammed. **MOHAMMEDANIZE**, v. *-īz*, to convert or make conformable to the religion of Mohammed. **MOHAMMEDANISM**, n. *-izm*, the system of religion founded by Mohammed, the principles of which are contained in the *Koran*: see below.

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MOHAMMED, *mo-hām'ed* (Arab. *the Praised**): founder of Islam: about 570-632, June 8; b. at Mecca, Arabia; son of Abdallâh, of the family of the Hâshim; and of Amina, of the family of Zuhra, both of the powerful tribe of the Koreish, but of a side-branch only, and therefore of little influence. His father, a poor merchant, died either before or shortly after M.'s birth, whom his mother then (according to a doubtful tradition) is supposed to have handed over, after the fashion of her tribe, to a Bedouin woman, that she might nurse him in the salubrious air of the desert. In consequence of the repeated fits of the child, however, which were ascribed to demons, the nurse sent him back in his third year. When he was six years old, his mother died; his grandfather, Abd-Al-Matullib, adopted the boy; and when, two years later, he too died, M.'s uncle, Abu Talib, though poor himself, took him into his house, and remained his best friend and protector throughout his life. The accounts which have survived of the time of his youth are too legendary to deserve credit; certain, however, it seems to be that he at first gained a scanty livelihood by tending the flocks of the Meccans, and that he once or twice accompanied his uncle on his journeys to s. Arabia and Syria. In his 25th year, he entered the service of a rich widow, Chaddîja, likewise descended from the Koreish; and accompanied her caravans—in an inferior capacity, perhaps as a camel-driver—to the fairs. Till that time, his circumstances were very poor. Suddenly his fortune changed. The wealthy, but much older, and twice widowed Chaddîja offered him her hand, which he accepted. She bore him a son, Al-Kâsim—whence M. adopted the name Abu Al-Kâsim—and four daughters: Zainab, Rukaija, Umm Kaltûm, and Fâtima; and afterward a second son, whom he called Abd Manâf, after an idol worshipped among his tribe. Both his sons, however, died early. M. continued his merchant's trade at Mecca, but without much energy, spending most of his time in solitary contemplations. In his 35th year, he is said to have, by chance only, been chosen arbiter in a quarrel about the replacing of the sacred black stone in the Kaaba (q.v.); but not before his 40th year is there anything really important to be told of his life.

Before entering on the weighty events of the subsequent period, it is well to advert to such traits of M.'s outward appearance as are yet recoverable. He was of middle height, rather lean, but broad shouldered, and altogether of strong build; slightly curled black hair flowed round his strongly developed head; his eyes, overhung with thick eyelashes, were large and coal-black; his nose, large and slightly bent, was well formed. A long beard added to the dignity of his appearance. A black mole between his shoulders became afterward among the faithful 'the seal of prophecy.' In his walk,

* M. is spelled also *Muhammad*, *Mohammad*, *Muhaumad*, and (less correctly) *Mahommed*, *Mahomet*, and (anciently) *Mahound*.

he moved his whole body violently, 'as if descending a mountain.' His gait and presence altogether were extremely imposing. In his 40th year M. received his first 'revelation,' in other words, became first aware that he had a 'mission.' About the year 600, Christianity had penetrated into the heart of Arabia, through Syria on the one hand and Abyssinia on the other. Judaism was no less prominent in the peninsula, chiefly in its n. parts, which were dotted over with Jewish colonies, founded by emigrants after the destruction of Jerusalem; and round about Yathrib (Medina). Besides these two all-important religious elements, several sects, remnants of the numerous ancient sects which had sprung up everywhere during the first Christian centuries: Sabians, Mandæans, etc., on the frontiers of Syria and Babylonia, heightened the religious ferment which, shortly before the time of M., had begun to move the minds of the thoughtful in all that portion of the East. At that time there arose, according to undoubted historical accounts, several men in the Hedjaz (Waraka, Obeid Allah, Othman, Zayd, etc.), who preached the futility of the ancient pagan creed, with its star-worship, its pilgrimages, and festive ceremonies, its temples and fetiches. It had in reality long ceased to be a living faith, and only the great mass of the people clung to it as to a sacred inheritance from times immemorial. The unity of God, the 'ancient religion of Abraham,' was the doctrine promulgated by these forerunners of M., and many of those who, roused by their words, began to search for a form of religion which should embody both the traditions of their forefathers and a purer doctrine of the Divinity, turned either to Judaism or to Christianity. The principal scene of these missionary labors was Mecca, then the centre of the pilgrimages of most of the Arabian tribes, and where, from times immemorial, long anterior to the city itself, the Kaaba (q.v.), Mount Arafat, the Valley of Mina, etc., were held sacred—the Koreish, M.'s tribe, having the supreme care over these sanctuaries, ever since the 5th c. It was under these circumstances that M. felt 'moved' to teach a new faith, which should dispense with idolatry on the one, as with Judaism and Christianity on the other hand. He was 40 years of age when he received the first 'divine' communication in the solitude of the mountain Hirâ, near Mecca. He declared that Gabriel appeared to him, and in the name of God commanded him to 'read'—that is, to preach the true religion, and to spread it abroad by committing it to writing (Sur. xevi.). How far M. was a 'prophet,' in the usual sense of the word, has been the subject of endless and utterly futile discussions in the Christian world. That he was no vulgar impostor, is now as generally recognized as that other once popular doctrine, that he was in conscious league with the devil, is rejected by thinking men. What part his epilepsy had in his 'visions,' we are not able to determine. Certain it is that, after long and painful solitary broodings, a something—not clearly known to himself—at times moved

him with such fearfully rapturous vehemence, that, during his revelations, he is said to have roared like a camel, and to have streamed with perspiration; his eyes turned red, and the foam stood before his mouth. The voices he heard were sometimes those of a bell, sometimes of a man, sometimes they came in his dreams, or they were laid in his heart. Waraka, one of his wife's relatives, who had embraced Judaism, spoke to him of the Jewish doctrine, and told him the story of the patriarchs and Israel; not so much as it is told in the Bible, but as in the Midrash; and the gorgeous hues of the legendary poetry of the latter seem to have made as deep an impression on M.'s poetical mind as the doctrine of the unity of God and the *morale*—in its broad outlines—of the Old Testament, together with those civil and religious laws, scriptural and oral, which are either contained as germs or fully developed in this record. Christianity exercised a minor influence on him and his spiritual offspring. All his knowledge of the New Testament was confined to a few apocryphal books, and with whatever reverence before Jesus, whom, together with Moses, he calls the greatest prophet, next to himself, his notions of the Christian religion and its founder were excessively vague. For some details on these points, see KORAN: MOHAMMEDANISM.

His first revelation (about 610) he communicated to no one, as it appears, except to Chadîdja, to his daughters, his stepson Ali, his favorite slave Zaid—whom he had probably freed and adopted by this time—and to his friend the prudent and honest Abu Bekr. His other relatives rejected his teachings with scorn. Abu Lahba, his uncle, called him a fool; and Abu Talib, his adoptive father, though he never ceased, for the honor of his family, to protect him, yet never professed any belief in M.'s words. In the fourth year of his mission, however, he had made 40 proselytes, chiefly slaves and people from the lower ranks; and now first some verses were revealed to him, commanding him to come forward publicly as a preacher, and to defy the scorn of the unbelievers. With all his power, he now inveighed against the primeval superstition of the Meccans, and exhorted them to a pious and moral life, and to the belief in an all-mighty, all-wise, everlasting, indivisible, all-just, but merciful God, who had chosen him as he had chosen the prophets of the Bible before him, so to teach mankind that they should escape the punishments of hell, and inherit everlasting life. God's mercy—this was a primitive doctrine, common to the whole East—was to be obtained principally by prayer, fasting, and almsgiving. The belief in the sacredness of the Kaaba and the ceremonies of the old heathen pilgrimage was too firmly rooted in his and the people's minds not to be received into the new creed; but certain barbarous habits of the Bedouins, such as the killing of their new-born daughters, were ruthlessly condemned by M. The prohibition of certain kinds of food also belongs to this first period, when he as yet stood

entirely under the influence of Judaism; the prohibition of gambling, usury, etc., probably being of somewhat later date. Whether he did or did not understand the art of writing and reading at the commencement of his career, is not clear; certain it is that he pretended not to know it, and employed the services of amanuenses for his Koranic dicta, which at first consisted merely of brief, rhymed sentences in the manner of the ancient Arabic soothsayers (see KORAN). The Meeans did not object to his doings; they considered him a common 'poet' or 'soothsayer,' who, moreover, was not in his right senses, or simply a liar. Gradually, however, as the number of his converts increased, they began to give more and more attention to his proceedings; and finally, fearing mostly for the sacredness of Meeah, which the new doctrine might abolish, thus depriving them of their chief glory and the ample revenues of the pilgrimages, they rose in fierce opposition against the new prophet and his adherents, who dared 'to call their ancient gods idols, and their ancestors fools.' Many of the converted slaves and freedmen had to undergo terrible punishments; others suffered so much at the hands of their own relatives, that they were fain to revoke their creed; so that the prophet himself advised his followers to emigrate to Abyssinia. M. himself, though protected by the strong arm of Abu Talib, was yet at that time so low-spirited and fearful, that he even raised in his doctrine the idols, which hitherto he had represented as naught, to intermediate beings between God and man—a dietum, however, which he soon revoked as an inspiration of Satan, thereby increasing the hatred of his adversaries, at whose head stood two members of the family of Machzûm, Al-Walid and Abulhakam Amr (called by Mohammed 'Father of Foolishness'), who in every way threw ridicule on him. At last it became necessary that he should be put beyond the reach of his persecutors, and Abu Talib hid him in a fortified castle of his own in the country. Hamza, his uncle, and Omar, formerly a bitter enemy of M., and who afterward became, next to M. and Abu Bêkr, the third head of Islam, continued in the mean time to spread the new doctrine. The Koreish now demanded that M. should be delivered into their hands; but Abu Talib steadfastly refused to comply with their wishes; a feud thereupon broke out between their family and that of the Hashemites, and M. and all the members of his family, except, perhaps, Abu Lahab, were excommunicated. After three years, however, the 'peace party' in Meeah brought about a reconciliation, and M. was allowed to return. A great grief befell him at this time—his faithful wife Chadîdja died, and, shortly afterward, his uncle Abu Talib, and, to add to his misery, the vicissitudes of his career had reduced him by this time to poverty. An emigration to Taïf, where he sought to improve his position, proved a failure; it was with great difficulty that he escaped with his life. During this epoch, he had the well-known dream of his journey to

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Jerusalem and in the heavens on the back of the Borak (Miraj), (see AL-BORAK), the relation of which caused even his staunchest adherents to smile at his hallucination. Shortly after his return from Taïf, he married Sauda, and afterward so increased the number of his wives, that at his death he left nine, of whom Ayesha, daughter of Abu Bekr, and Hafsa, daughter of Omar, are best known. In the midst of his vain endeavors to find a hearing in his own city, and cities near it, he succeeded, during a pilgrimage, in converting several men of Medina, whose inhabitants had long been accustomed to hear from the mouths of the numerous Jews living in the city and its neighborhood the words Revelation, Prophecy, God's Word, Messiah: to the Meccans mere sounds without any meaning. The seed sown in the prepared minds of these men bore a fruitful harvest. The next pilgrimage brought 12, and the third more than 70 adherents to the new faith from Medina, and with these he entered into close alliance. M. now conceived the plan to seek refuge in the friendly city of Medina, and about 622 (10, 13, or 15 years—according to the different traditions—after his first assuming the sacred office) he fled thither, about 100 families of his faithful flock having preceded him, accompanied by Abu Bekr, and reached, not without danger, the town, called thence Medinat Annabi (City of the Prophet), or Medina 'City,' by way of eminence; and from this flight, or rather from the first month of the Arabic year preceding it (i.e., 68 days earlier), dates the Mohammedan Era [Hedjrah], A.D. 622, July 15 or 16 (see HEGIRA). Now everything was changed to the advantage of the prophet and his religion; and while the incidents of his previous life are shrouded in comparative obscurity, those after this date are known often to their insignificant details. Formerly a despised 'madman or impostor,' he now assumed at once the position of highest judge, lawgiver, and ruler of the city and two most powerful Arabic tribes. His first care was directed toward the consolidation of the new worship, and the inner arrangements in the congregation of his flock; his next chief endeavor was to proselytize the numerous Jews who inhabited the city, to whom, besides having received their principal dogmas into his religion, he made many important concessions also in the outer observances of Islam, and concluded alliances with many of their tribes; but he was sorely disappointed in his hopes to convert them. They ridiculed his pretension to be the Messiah, and so enraged him by their constant taunts, that he soon abrogated his concessions, and became their bitterest adversary up to the hour of his death. The most important act in the first year of the Hedjrah was his permission of his followers to go to war with the enemies of Islam in the name of God—a kind of manifesto directed chiefly against the Meccans. Not being able at first to fight his enemies in open field, he endeavored to weaken their power by attacking the caravans of the Koreish on their way to Syria. Being successful

enough to disturb their trade, and, at the same time, to conclude alliances with the adjoining Bedouin tribes, he at last dared to break even the peace of the sacred month of Radjab, and with this the signal to open warfare was given. A battle, the first, was fought between 314 Muslims and about 600 Meccans at Badr, in the second year of the Hedjrah; the Muslims gained the victory, and made many prisoners. A great number of adventurers now flocked to M.'s side, and he successfully continued his expeditions against the Koreish and the Jewish tribes, chiefly the Beni Keinukâ, whose fortified castles he took after a long siege. Notwithstanding a severe loss which he suffered in the battle near Ohod, in which he himself was dangerously wounded, his power increased so rapidly that as early as in the sixth year of the Hedjrah (A.D. 628) he was able to proclaim a public pilgrimage to Mecca. Although the Meccans did not allow this to be carried out, he gained the still greater advantage that they concluded a formal peace with him, and thus recognized him as an equal power and belligerent. He was now allowed to send his missionaries all over Arabia, and even beyond the frontiers, without any hindrance; and in the following year he had the satisfaction of celebrating the pilgrimage for three days undisturbed at Mecca. Shortly afterward, during his expeditions against the Jews of Chaibar and Fadak, M. very nearly lost his life: a Jewess, Zainab by name, a relative of whom had fallen in the fight against him, placed a poisoned piece of roast meat before him, and though he merely tasted it, he yet, till his death, suffered from the effects of the poison. His missionaries at this time began to carry his doctrines abroad, to Chosroes II., to Heraclius, to the king of Abyssinia, the viceroy of Egypt, and the chiefs of several Arabic provinces. Some received the new gospel; but Chosrû Parvis, King of Persia, and Amru the Ghassanide, rejected his proposals with scorn, and the latter put to death his messenger. This was the cause of the first war between the Christians and the Muslims, in which the Muslims were beaten by Amru with great loss. The Meccans now thought the long-desired moment of revenge at hand, and broke the peace by several acts of violence against the Chuzaites, allies of M.; but he marched at the head of 10,000 men against Mecca, before its inhabitants had time to prepare for the siege, took it, and was publicly recognized by them as chief and prophet. With this the victory of the new religion was secured in Arabia. While, however, employed in destroying all traces of idolatry in the besieged city, and fixing the minor laws and ceremonies of the true faith, M. heard of new armies which several warlike Arabic tribes were bringing against him, and which were concentrated near Taïf (630). Again he was victorious, and his dominion and creed extended further and further every day. From all parts flocked the deputations to do homage to him in the name of the various tribes, either as the messenger of God, or at least as the Prince of Arabia; and the

year 8 of the Hedjrah (A.D. 630) was therefore called the year of the Deputations. Once more he made extensive preparations for a war against the Byzantines; but not being able to bring together a sufficient army, he had to be satisfied with the homage of a few minor princes on his way to the frontiers, and to return without fulfilling his intention. Toward the end of the 10th year of the Hedjrah (A.D. 631) he undertook, at the head of at least 40,000 Muslims, his last solemn pilgrimage to Mecca, and there (on the Mount Arafat—q.v.) instructed them in all the important laws and ordinances, chiefly of the pilgrimage; and the ceremonies observed by him on that occasion were fixed for all times (see HAJJ). He again solemnly exhorted his believers to righteousness and piety, recommending them chiefly to protect the weak, the poor, and the women, and to abstain from usury.

Returned from Mecca, M. occupied himself again with planning his expedition against Syria, but fell dangerously ill very soon after his return. One night, while suffering from an attack of fever, he went to the cemetery of Medina, and prayed and wept upon the tombs, praising the dead, and wishing that he himself might soon be delivered from the storms of this world. For a few more days he went about; at last, too weak further to visit his wives, he chose the house of Ayesshah, near a mosque, as his abode during his sickness. He continued to take part in the public prayers as long as he could; until at last, feeling that his hour had come, he once more preached to the people, recommending Abu Bekr and Usma, the son of Zaid, as the generals whom he had chosen for the army. He then asked, like Moses, whether he had wronged any one, and read to them passages from the Koran, preparing the minds of his hearers for his death, and exhorting them to peace among themselves, and to strict obedience to the tenets of the faith. A few days afterward, he asked for writing materials, probably in order to fix a successor to his office as chief of the faithful; but Omar, fearing he might chose Ali, while he himself inclined to Abu Bekr, would not allow him to be furnished with them. In his last wanderings he spoke only of angels and heaven. He died in the lap of Ayesshah, about noon of Monday the 12th (11th) of the third month, in the year 11 of the Hedjrah (A.D. 632, June 8). His death caused immense excitement and distress among the faithful, and Omar, who himself would not believe in it, tried to persuade the people of his still being alive. But Abu Bekr said to the assembled multitude: 'Whoever among you has served Mohammed, let him know that Mohammed is dead; but he who has served the God of Mohammed, let him continue in his service, for he is still alive, and never dies.' While his corpse was yet unburied, the quarrels about his successor, whom he had not been able definitively to appoint, commenced; and finally, Abu Bekr received the homage of the principal Muslims at Medina. M. was then buried in the night June 9-10, after long discussions, in the house of

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Ayeshah, where he had died, and which afterward became part of the adjoining mosque.

This, in briefest outline, is M.'s career, not presenting at any length, either the peculiar circumstances of his inner life, which preceded and accompanied his 'prophetic' course, nor the part which Idolatry, Judaism, Christianity, and his own reflection respectively, bore in the formation of his religion; nor tracing the process by which his 'mission' grew upon him, and he, from a simple admonisher of his family, became the founder of a faith to which more than 130 millions are said now to adhere. For some further details on his doctrine and its history, see KORAN: MOHAMMEDANISM: also MOHAMMEDAN SECTS: SUNNA: SUNNITES: SHIITES. It is to be remembered that a man of M.'s extraordinary powers and peculiar nature is not to be judged by a modern commonplace standard; also the manners and morals of his own time and country must be taken into consideration. His character certainly is not praiseworthy. He was at times deceitful, cunning, revengeful, and cowardly; he ordered many assassinations, and massacred at one time 600 Jews; and he was addicted to sensuality beyond all limits. But all this does not justify the savage and silly abuse which has been heaped upon his name for centuries by ignorance and fanaticism. Consideration must be had not only of his public station as prophet, preacher, and prince, but also his general amiability, his faithfulness toward his friends, his tenderness toward his household, and his occasional readiness to forgive an enemy: moreover the extreme simplicity of his domestic life (he lived, when in full power, in a miserable hut, mended his own clothes, and freed all his slaves), must be taken into consideration: and, to do him justice, his melancholic temperament, his nervousness often bordering on frenzy and which brought him to the brink of suicide, and the fact that he was a poet of high order, with all the weaknesses of a poet developed to excess, must not be forgotten. Altogether, his mind contained the strangest mixture of nobleness and baseness, of truth and error. Although his self-chosen mission was the abolition of superstition, he yet believed in Jins, omens, charms, and dreams: and this is an additional reason against the now generally abandoned notion, that he was a vulgar designer, who by no means deceived himself about those revelations which he pretended to have received. And however much the religion of Islam may be considered the bane and prime cause of the rottenness of eastern states and nations in our day, it must not be forgotten, in the first place, that it is not necessarily Islam which has been the sole cause of the corruption; and in the second place, that Mohammed is not to be made responsible for all the errors of his successors. Fanaticism may be the secret of the strange mixture in his character, and the source of his consuming zeal; partly the fanaticism of a stern rude justice, partly the fanaticism of a self-exaltation verging on mental disorder, and drawing from his cataleptic fits

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the fabric of those hallucinations which he accepted and proclaimed as revelations from God. His fanaticism seems to have become less honest as his power advanced, and his later years give signs of that hypocrisy which seeks to use spiritual motives for merely political ends.

The most important European biographies of M. are those of Sprenger, Weil, Muir, Nöldeke, Reinaud.

MOHAMMED II. (BUJUK or THE GREAT), Sultan of Turkey: conqueror of Constantinople: 1430–81 (reigned 1450–81); b. Adrianople; son and successor of Amurath II. His first acts were the murder of his two brothers, and the suppression of a rebellion in Karaman. Having thus secured himself on the throne, he bent all his energies to the great project always kept prominently in view by his predecessors—the capture of Constantinople. This city was now the sole remnant of the once mighty empire of the Cæsars; and after more than a year spent in preparations, M. commenced the siege, 1453, Apr. 6, with an army of 258,000 men, and a fleet of 320 vessels. The Greeks, aided by a gallant band of 2,000 strangers, under Gian Justiniani, a noble Genoese, long maintained an obstinate resistance. On the morning of May 29, a combined attack was made by land and sea without success; but the retirement from the ramparts of Justiniani, who had been severely wounded, and despaired of a successful defense, caused a panic among his followers, and the simultaneous charge of a chosen body of janizaries, with M. himself at their head, was irresistible. Constantine XIII. died in the breach, and the Turks poured in over his corpse to plunder and devastate his capital. M. transferred the seat of his government to Constantinople, and sought to win back the inhabitants by promising them free exercise of their religion. He next reduced the kingdoms of Morea and Trebizond, offshoots of the Greek empire, obtained possession of Servia on the death of its last prince, and made formidable preparations for invasion of Hungary. Belgrade was the first point of attack; and with 100,000 men, supported by a fleet of 200 ships on the Danube, M. sat down before its walls. The enormous ordnance which had done such good service at Constantinople, were employed to batter the ramparts; but the valor, skill, and activity of the defenders foiled his utmost efforts. John Hunyady (q.v.), who, with 5,000 chosen troops, had reinforced the garrison, destroyed or captured all his vessels, and soon afterward by a sudden sally, defeated his army, and carried off the battering-train, compelling him to raise the siege, 1456, Aug. 6. M.'s next enterprise was the invasion of Epirus, where Scanderbeg had hitherto successfully defied the sultan's power. Three Turkish armies were destroyed in rapid succession, and a fourth and fifth under M. himself met with no greater success; but the death of the gallant Epirote, 1467, removed the only obstacle to the sultan's plans, and Epirus was forthwith annexed to Turkey. The latter half of M.'s reign was fruitful in important achievements; he reduced the Khan

of the Crimea to the condition of a vassal, deprived the Genoese of Caffa, and the Venetians of Friuli, Istria, Negropont, and Lemnos; but the Knights of St. John repelled him from Rhodes, and the Venetians from Scodra. He carried his arms into Italy, and took Otranto; but died at Nicomedia, while on the way to join his son Bajazet, who was warring with the Persians and Egyptians. His frequent contests with the former of these nations had always interfered with the successful prosecution of his designs of conquest in Europe. M. had great abilities; he was brave, enterprising, and sagacious; nor was he deficient in learning, for he spoke four languages fluently, was well versed in geography, ancient history, and the natural sciences, and was practically acquainted with the fine arts. But the brilliancy of his career, and the occasional generosity and even magnanimity which he showed, cannot obliterate the recollection of those acts of cruelty and treachery which have justly branded him as the most ruthless tyrant of the House of Osman. As the founder of the Turkish power in Europe, his memory has always been revered by the Turks.

MOHAMMEDANISM: the religion founded by Mohammed (q.v.); according to him, the only orthodox creed existing from the beginning of the world, and preached by all the prophets ever since Adam. It is called also *Islâm*, Resignation, entire Submission to the will and precepts of God. In its exclusively dogmatical or theoretical part, it is *Imân*, Faith; in its practical, *Dîn*, Religion (by way of eminence). The fundamental principles of Imân are contained in the two articles of belief: 'There is no God but God; and Mohammed is God's Apostle.' The Mohammedan doctrine of God's being and attributes coincides with the Christian, so far as relates to him as the Creator of all things in heaven and earth, who rules and preserves all things; who is without beginning, omnipotent, omniscient, omnipresent, and full of mercy. Yet, according to the Mohammedan belief, God has no offspring: 'He begetteth not, nor is he begotten.' Nor is the Lord Jesus called anything more than a great prophet and apostle, though his birth is said to have been due to a miraculous divine operation; and as the Koran superseded the Gospel, so Mohammed, Christ. The crucifixion is said to have been executed upon another person, Christ having been taken up into God before the decree was carried out. He will come again upon the earth, to establish everywhere the Moslem religion, and to be a sign of the coming of the day of judgment. Next to the belief in God, that in angels forms a prominent dogma. Created of fire, and endowed with a kind of uncorporeal body, they stand between God and man, adoring or waiting upon the former, or interceding for and guarding the latter. The four chief angels are 'The Holy Spirit,' or 'Angel of Revelations'—Gabriel; the special protector and guardian of the Jews—Michael; the 'Angel of Death'—Azraël (Raphael, in the apocryphal gospel of Barnabas), and Israfil—Uriel, whose office it will be to

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sound the trumpet at the Resurrection. Most of Mohammed's 'religious' notions were taken almost bodily from the Jewish legends: his angelology, however, the Jews themselves had not received from their Scriptures, but had borrowed from the Persians, only altering the names, and, in a few cases, the offices of the chief angelic dignitaries (see ANGEL: ARCHANGEL). Besides angels, there are good and evil genii or Jinn (q.v.), the chief of the latter being Iblis (Despair), once called Azazel, who, refusing to pay homage to Adam, was rejected by God. These Jinn are of a grosser fabric than angels, and subject to death. They, too, have different names and offices (Peri, Fairies; Div, Giants; Takvins, Fates, etc.), and are, in almost every respect, like the Shédim in the Talmud and Midrash. A further point of the system is the belief in certain Scriptures, revealed from God successively to the different prophets. Four only of the original 104 sacred books: viz., the Pentateuch, the Psalms, the Gospel, and the Koran, are said to have survived; the three former, however, in a mutilated and falsified condition. Besides these, a certain apocryphal gospel, attributed to St. Barnabas, and the writings of Daniel, together with those of a few other prophets, are noticed by the Moslems, but not as canonical books. The number of prophets, sent at various times, is stated variously at between two and three hundred thousand; among whom 313 were apostles, and six were specially commissioned to proclaim new laws and dispensations, which abrogated the preceding ones. These were Adam, Noah, Abraham, Moses, Jesus, and Mohammed—the last the greatest of them all, and the propagator of the final dispensation. The belief in the resurrection and the final judgment is the next article of faith. The dead are received in their graves by an angel announcing the coming of the two examiners, Monker and Nakir, who put questions to the corpse respecting his belief in God and Mohammed, and who, in accordance with the answers, either torture or comfort him. This, again, is the Jewish 'Chibbut hakkeber,' the Beating of the Grave, a hyperbolical description of the sufferings during the intermediate state after death (purgatory). The soul, awaiting the general resurrection, enters according to its rank, either immediately into paradise (prophets), or partakes, in the shape of a green bird, of the delights of the abode of bliss (martyrs), or—in the case of common believers—is supposed either to stay near the grave, or to be with Adam in the lowest heaven, or to remain either in the well of Zem-Zem, or in the trumpet of the resurrection. According to others, it rests in the shape of a white bird under the throne of God. The souls of the infidels dwell in a certain well in the province of Hadramaut (Heb. Chambers of Death), or, being first offered to heaven, then offered to earth, and rejected by either, remain subject to unspeakable tortures until the day of resurrection. Concerning the latter, there is great discrepancy among the Mohammedan theologians. Mo-

hammed himself seems to have held that both soul and body will be raised, and the 'Bone Luz' of the Jewish Haggadah was by him transformed into the bone Al A. b, the rumpbone, which will remain uncorrupted till the last day, and from which the whole body will spring anew, after a 40 days' rain. Among the signs by which the approach of the last day may be known—nearly all taken from the legendary part of the Talmud and Midrash, where the signs of the coming of the Messiah are enumerated—are the decay of faith among men, the advancing of the meanest persons to highest dignities, wars, seditions, and tumults, and consequent dire distress, so that a man passing another's grave shall say: 'Woe to God I were in his place!' Certain provinces shall revolt, and the buildings of Medina shall lead to Yal'ab. Again: the sun will rise in the west, the East will appear, Constantinople will be taken by the descendants of Isaac, the Anti-Christ will come, and be killed by Jesus at Lud. There will further take place a war with the Jews, Gog and Magog's (Jajug and Majuj's) eruption, a great smoke, an eclipse, the Mohammedans will return to idolatry, a great treasure will be found in the Euphrates, the Kaaba will be destroyed by the Ethiopians, beasts and inanimate things will speak, and finally, a wind will sweep away the souls of those who have faith, even if equal only to a grain of mustard seed, so that the world shall be left in ignorance. The time of the resurrection, even Mohammed could not learn from Gabriel: it is a mystery. Three blasts will announce it: that of consternation, of such terrible powers, that mothers shall neglect the babes on their breasts, and that heaven and earth will melt; that of exanimation, which will annihilate all things and beings, even the angel of death, save paradise and hell, and their inhabitants: and forty years later, that of resurrection, when all men, Mohammed first, shall have their souls breathed into their restored bodies, and will sleep in their sepulchres until the final doom has been passed upon them. The day of judgment, lasting from one to 50,000 years, will call up angels, genii, men, and animals. The trial over, the righteous will enter paradise, to the right hand, and the wicked will pass to the left, into hell; both, however, have first to go over the bridge Al Sirât, laid over the midst of hell, and finer than a hair, and sharper than the edge of a sword, and beset with thorns on either side. The righteous will proceed on their path with ease and swiftness, but the wicked will fall down headlong to hell below—a place divided into seven stories or apartments, respectively assigned to Mohammedans, Jews, Christians, Sabians, Magians, idolators, and—the lowest of all—to the hypocrites, who, outwardly professing a religion, in reality had none. The degrees of pain—chiefly consisting in intense heat and cold—vary; but the Mohammedans, and all those who professed the unity of God, will finally be released, while unbelievers and idolaters will be condemned to eternal punishment. Paradise is divided from hell by a parti-

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tion (Orf), in which a certain number of half-saints will find place. The blessed, destined for the abodes of eternal delight (Jannat Aden, Heb. Gan Eden)—of which it is, however, not quite certain whether it is created already—will first drink of the Pond of the Prophet, which is supplied from the rivers of paradise, whiter than milk, and more odoriferous than musk. Arrived at one of the eight gates, they will be met by beautiful youths and angels; and their degree of righteousness (prophets, religious teachers, martyrs, common believers) will procure for them the corresponding degree of happiness. It is, however, the Mohammedan doctrine, that not a person's good works or merits will gain his admittance, but solely God's mercy; also that the poor will enter paradise 500 years before the rich; and that the majority of the inhabitants of hell are women. As to the various felicities which await the pious (and of which there are about a hundred degrees), they are a wild conglomeration of Jewish, Christian, Magian, and other fancies on the subject, to which the Prophet's own exceedingly sensual imagination has added considerably. Feasting in the most gorgeous and delicious variety, the most costly and brilliant garments, odors and music most ravishing, and above all, the enjoyment of the Hûr Al Oyûn, the black-eyed daughters of paradise, created of pure musk, and free from all the bodily weaknesses of the female sex, are held out as a reward to the commonest inhabitants of paradise, who will always remain in the full vigor of their youth and manhood.* For those deserving a higher degree of recompense, rewards will be prepared of a purely spiritual kind—i.e., the 'beholding of God's face' (Shechinah) by night and by day. A separate abode of happiness will also be reserved for women, but there is considerable doubt as to the manner of their enjoyment. That they are not of a prominently spiritual nature, is clear from the story of the Prophet and the old woman. The latter solicited Mohammed to intercede with God that she might be admitted into paradise, whereupon he replied that old women were not allowed in paradise, which dictum—causing her to weep—he further explained by saying that they would first be made young again. The last of the precepts of pure faith taught by Mohammedanism is the full and unconditional submis-

* 'The whole earth will be as one loaf of bread, which God will reach to them like a cake; for meat they will have the ox Balâm and the fish Nûn, the lobes of whose livers will suffice 70,000 men. Every believer will have 80,000 servants and 72 girls of paradise, besides his own former wives, if he should wish for these, and a large tent of pearls, jacinths, and emeralds: 300 dishes of gold shall be set before each guest at once, and the last morsel will be as grateful as the first. Wine will be permitted, and will flow copiously, without inebriating. The righteous will be clothed in the most precious silks and gold, and will be crowned with crowns of the most resplendent pearls and jewels. If they desire children, they shall beget them, and see them grow up within an hour. Besides the ravishing songs of the angel Israfil and the daughters of paradise, the very trees will, by the rustling of their boughs, the clanging of bells suspended from them, and the clashing of their fruits, which are pearls and emeralds, make sweetest music.'

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sion to God's decree (ISLAM—see ISLAMISM), and the predestination of good and evil, which is found from the beginning inscribed on a 'preserved table.' Not only a man's fortunes, but his deeds, and consequently his future reward or punishment, are irrevocably, and thus unavoidably, pre-ordained (see FATE: FATALISM): a doctrine which is not, however, taken literally by *all* Moslems, but which has no doubt contributed largely to the success of Islam, by inspiring its champions with the greatest indifference and contempt for the dangers of warfare; their destiny being immutably fixed under any circumstances.

Thus far, briefly, the Iman, dogmatical or theoretical part of Islam. The Din, or practical part, which contains the ritual and moral laws, inculcates as the chief duties the following four: prayer, almsgiving, fasting, and pilgrimage.

Prayer, 'the key of paradise,' comprises also certain religious purifications, as the most necessary preparations to the former. They are of two kinds: the *Ghusl*, or total immersion of the body, required as a religious ceremony, on some special occasions; and the *Wudû*, a partial ablution, to be performed immediately before the prayer. This is of primary importance, and consists of the washing of hands, face, ears, and feet up to the ankles—a proceeding generally accompanied at each stage by corresponding pious sentences, and concluded by the recital of the 97th chapter of the Koran. In the case of water being beyond reach, dry dust or sand may supply its place. 'The practice of religion being founded on cleanliness,' it is not sufficient that the believer himself should be purified, but even the ground or the carpet upon which he prays must be as clean as possible, and the use of a special prayer-carpet (*Scggadéh*) is therefore recommended. Every Mohammedan is obliged to pray five times in every 24 hours. The prayer (*Salah*) itself consists partly of extracts from the Revealed Book, the Koran (*Fard*), partly of pieces ordained by the Prophet without allegation of a divine order (*Sunnah—q.v.*). The first time of prayer commences at the *Maghrib*, or about sunset; the second, at the *Eshë*, or nightfall; the third, at the *Subh*, or daybreak; the fourth, at the *Duhr*, or about noon; the fifth, at the *Asr*, or afternoon. The believers are not to commence their prayers exactly at sunrise, or noon, or sunset, lest they might be confounded with the infidel Sun-worshippers. These several times of prayer are announced by the *Muëzzins* (*q.v.*) from the minarets or *madnehs* of the mosques. Their chant, sung to a very simple but solemn melody, sounds harmoniously and sonorously down the height of the mosque, through the midday din and roar of the cities, but its impression is most strikingly poetical in the stillness of night; so much so, that even many Europeans cannot help congratulating the Prophet on his preferring the human voice to either the Jewish trumpet-call of the time of the Temple, or the Christian church-bells. The day-call

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(the Adan) consists chiefly of the confession of faith (God is most great—Mohammed is God's apostle—come to prayer, come to security) repeated several times; the night-calls (Ula, the first; Ebed, the second), destined for persons who desire to perform supererogatory acts of devotion, are much longer. The believer often changes his posture during his prayers; and a certain number of such inclinations of head and knees, prostrations, etc., is called a *Rekah*. It is also necessary that the face of the worshipper should be turned toward the *Kibleh*, in the direction of Mecca (q.v.), the exterior wall of the mosque marking that direction being distinguished by a niche (*Mehrab*). All sumptuous and pompous apparel is laid aside before the believer approaches the sacred place; and the extreme solemnity and decorum, the unaffected humility, the real and all-absorbing devotion which pervades it, have been often held up as an example to other creeds. Women, though not strictly forbidden to enter the mosque, yet are not practically allowed to pray there, lest their presence might be hurtful to true devotion. Besides these prayers, there are others ordained for special occasions, as on a pilgrimage, before a battle, at funerals, during an eclipse, etc. That the Moslems do not pray to Mohammed, but simply implore his intercession, as they do that of the numerous saints, the relatives of the Prophet, and the first propagators of Islam, need not be dwelt upon here (see *MOHAMMED*). For the particulars of the service in the Mosque, see *MOSQUE*. Mohammedanism has no clergy in our sense of the word, the civil and religious law being combined in one. See also *MOLLAH*: *MUFTI*.

Next in importance stands the duty of giving alms. These are twofold—legal (*Zekah*) and voluntary (*Sadakah*; Heb. *Zedakah*, piety, righteousness); but the former, formerly collected by the sovereign, and applied to pious uses, has now been practically abrogated. The *Sadakah* is, according to the law, to be given once every year, of cattle, money, corn, fruits, and wares sold, at about the rate of from two and a half up to twenty per cent. Besides these, it is usual to bestow a measure of provisions on the poor, at the end of the sacred month of *Ramadán*.

The duty of fasting follows (see *FAST*—*Fasting*). During the whole month of *Ramadán*, the Moslem is commanded to refrain from eating, drinking, smoking, smelling perfumes, bathing, and every unnecessary indulgence in worldly pleasure—from daybreak until sunset. From sunset till the morning, he is allowed to eat, drink, and enjoy himself. The Arabian year being lunar, it often happens that the *Ramadán* falls in midsummer, when the fasting, especially the abstaining from drinking, is excessively mortifying. None are exempt from this duty save the sick, travellers, and soldiers in time of war; but they are bound to fast an equal number of days during some other months. Nurses and pregnant women are entirely free from fasting. It is Mohammed's special and express desire, that no one should fast who is not quite equal to

it, lest he might injure his health, and disqualify himself for necessary labor. Of the other commendable fast-days, the Ashura, on the 10th of Moharram (the Jewish Jom Kippur), deserves special mention. There are very few Moslems who do not keep the Ramadán, even if they neglect their other religious duties; at all events, they all pretend to keep it most strictly, fasting being considered 'one-fourth part of the faith'—nay, 'the gate of religion.'

For the fourth paramount duty of the Mohammedan—the pilgrimage to Mecca—see MECCA: especially HAJJ. Suffice it here briefly to recapitulate, that the Kaaba (q.v.) is to be encompassed seven times, the celebrated black stone being kissed at each round, that Mount Arafat (q.v.) is to be visited, the sacrifice El-Fida (the Ransom, in memory of Ishmael's sacrifice) to be performed, and a number of minor ceremonies to be gone through by the pilgrim, and that he who neglects to perform the sacred pilgrimage 'might as well die a Jew or a Christian.'

To the 'positive' ordinances of Islam may be reckoned also the 'Saghir,' or minor, and 'Kebir,' or great, festivals (see FESTIVALS). The first (Al-Fetr, or breaking the fast), following immediately upon the Ramadán, begins on the first day of the month of Shawál, and lasts three days. The second (Eed Al-Kurban, or sacrifice) begins on the 10th of Dsu'l Heggch, when the pilgrims perform their sacrifice, and lasts three or four days. Yet, though intended to be the most important of the two, the people have in most places changed the order, and, by way of compensation for the previous fast, they make the lesser festival which follows the Ramadán the most joyful and the longest of the two. The day set aside for the weekly day of rest is the Friday—not, as is generally supposed, because both the Jewish Sabbath and the Christian Lord's Day were to be avoided, but because, from times long before Mohammed, the Arabian people used to hold public assemblies for civil as well as religious purposes on that day. The celebration of the Moslem days of religious solemnity is far less strict than is the custom with the other Shemitic religions. Service being over, the people are allowed to return to their worldly affairs, if they cannot afford to give themselves up entirely to pleasure or devotion for the rest of the sacred period.

Thus far, briefly, the principal positive laws of Islam relating to faith and practice. We turn to the fundamental prohibitory laws contained in the Koran.

First of all, the drinking of wine, which includes all strong and inebriating liquors, as giving rise to 'more evil than good,' is rigorously forbidden; and though of late, chiefly through European influence, very many Moslems have lost their religious scruples on that score, and not only secretly, but openly, indulge in spirits, yet the great bulk of the faithful refuse even to make use of the proceeds of the sale of wine or grapes. Some over-scrupulous believers even include opium, coffee, and to-

bacco in the prohibition; but general practice has decided differently. The prohibitory laws respecting food resemble closely those of Judaism: blood, the flesh of swine, moreover animals which have died from disease or age, or on which the name of some idol has been invoked, or which have been sacrificed unto an idol, or which have been strangled, or killed by a blow, a fall, or by some other beast, are strictly forbidden. 'Pure' animals must be slaughtered according to certain fixed rules, and the name of God is to be invoked before the operation, without, however, the usual addition of the benevolent epithets, since these would ill befit the sufferings of a fellow-creature. Fish, birds, game, are mostly allowed for food, yet there are in nearly all cases certain religious ceremonies to be observed, before they become fit for the believer's table.

All games subject to chance ('casting lots by arrows')—such as dice, cards, tables, bets, etc.—are considered so wicked, that a gambler's testimony is invalid in a court of law. (The Talmud rejects the testimony of only the habitual '*dice*—[Kubia—i.e., Cube] *gambler* and *better upon doves*.') Chess and other games depending on skill—provided they do not interfere with the regular performance of religious duties, and that they are played without any stakes whatsoever—are allowed by the majority of Moslem theologians. Usury is strictly prohibited. Taking interest on any loan, however large or small, or profiting in trade through any questionable means, save by buying and selling, is severely condemned.

To prevent the faithful from ever falling back into idolatry, the laws relating to images and pictures have been made very stringent. Whosoever makes an imitation of any living being in stone, wood, or any other material, shall, on the day of judgment, be asked to endow his creation with life and soul, and, on his protesting his inability of doing so, shall undergo the punishment of hell for a certain period.

The civil and criminal laws of Mohammedanism, founded both on the Koran and the Traditions (*Sunna*), are, in some instances, where the letter of the written or oral precept allows of various explanations, or where the case in question is not foreseen, interpreted according to the opinion of one of the four great masters of Islam, Abu Hanífa, Malec Ibn Ans, Sháfeï, Ibn Hanbal, within the pale of their respective sects. The principal points, however, on which all Mohammedans agree are the following: Polygamy is allowed, not, as is commonly supposed, without any restriction, but: 'Take in marriage, of the women who please you, two, three, or four; but if ye fear that ye cannot act equitably, one; or those whom your right hands have acquired'—i.e., your slaves. These are the explicit words of the Koran (iv. 3), so that four wives, and a certain number of concubine slaves, is the whole extent to which a Moslem may legally go. The Prophet's example proves nothing to the contrary,

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since he was endowed with special privileges, and not subject to the common law in many respects. It is, moreover, added, as an advice, that to marry one or two is quite sufficient for a man, if he apprehend any inconvenience from a larger number of wives. A Moslem may, if urged by excessive love, or if unable to obtain a wife of his own creed, marry a Christian woman or a Jewess; but a Mohammedan woman is not, under any circumstances, to marry an unbeliever. In all cases, however, the child born of a Moslem, whatever the mother's faith, is a Moslem; nor does the wife who is an unbeliever inherit at her husband's death. Forbidden degrees of consanguinity, etc., in marriage are: the mother, daughter, sister, half-sister, aunt, niece, foster-mother, or a woman related to the faithful 'by milk in any of the degrees which would preclude his marriage with her, if she were similarly related to him by consanguinity;' the mother of his wife, even if he be not properly married to the latter yet; the daughter of his wife, if the latter still be his legal wife; his father's wife and his son's wife; or two sisters at the same time; or wives who stand to each other in the relation of aunt and niece; or the unemancipated slave, or another man's slave, if he have already a free wife. A simple declaration of a man and woman at the age of puberty, before two witnesses, of their intention to marry each other, and the payment of part of the dowry (which is indispensable, and must amount to at least ten dirhems, or about five shillings = about \$1.25), is sufficient for a legal marriage. A girl under age is given away by her natural or appointed guardian, with or without her consent. To see the face of any woman who is neither his wife nor his concubine, nor belongs to any of the forbidden degrees, is strictly forbidden to the believer. Divorce is a comparatively light matter with the Mohammedans. Twice, a man may send away his wife and take her back again without any ceremony; the third time, however—if he unite the triple divorce in one sentence at once—he dare not receive her again in wedlock until she have been married properly to another man in the mean time. Mere dislike is sufficient reason for a man to dissolve the conjugal ties, and his saying: 'Thou art divorced,' or 'I divorce thee,' together with the payment of part of the wife's dowry, is all that is required from him by the law. A wife, on the other hand, is bound to her husband forever, unless she can prove some flagrant ill-usage or neglect of conjugal duty on his part; and even then, she forfeits part, or the whole, of her dowry. A divorced woman is obliged to wait, like a widow, for a certain period before marrying again: if pregnant, until delivery; three months, or four months and ten days, according to circumstances. If she have a young child, she is to suckle it until it be two years old, and the father is to bear all the expenses of the maintenance of mother and child. A woman proving disobedient to her husband may be declared by the kadi 'náshizeh'—i.e., rebellious, and the husband is no longer

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bound to maintain her. Yet, he cannot be forced to divorce her under these circumstances, so that the woman is generally in so sore a plight that she is obliged to promise good behavior for the future, and the husband has then either to take her back to his house, or to set her free by a formal divorce. On the other hand, it often happens that a woman prefers a mere separation, to continuing to live with her husband; in which case she gets herself, of her own accord, inscribed a 'náshizeh.' If a slave becomes a mother by her master, and he acknowledges the child to be his own, the child is free, and the mother is to be emancipated at the master's death, and may not be given away, or otherwise disposed of by him, during his lifetime. A free person, wishing to marry his or her slave, must first emancipate this slave; and if the slave of another person has been married by a free man or woman, and afterward becomes the latter's property, the marriage becomes illegal, and can be renewed only by a legal contract and emancipation.

The privilege of primogeniture does not exist in the Mohammedan law, but males generally receive a double share. A person may not bequeath more than one-third of his property, unless there be no legal heirs. Children, whether begotten with the legal wife, or slave, or concubine, or only adopted, and their descendants, are the first heirs; next come the claims of wives, parents, brothers, sisters, in their order. Where there is no legal heir, the property falls to the crown.

The law is very lenient toward debtors, the Koran recommending the creditor to remit a debt 'as alms.' Insolvency, and inability to work for the discharge of the claim, solve all further obligations. The most conscientious performance of all private contracts, however, is constantly recommended in the Koran.

Murder is punished either with death, or by the payment of a fine to the family of the deceased, according to their own pleasure. There must, however, be palliating circumstances in the latter case. The Bedawis, however, have expanded the law of blood-revenge in a terrible manner, and up to this day the 'vendetta' often rages not only between family and family, but between whole tribes, villages, and provinces. Unintentional homicide is expiated by freeing a believer from slavery, and paying to the family a certain sum in proportion to the rank and sex of the deceased. He who has not the means of freeing a believer is to fast for two months, by way of penance. According to the strict letter of the law, a man is not liable to capital punishment for killing his own child or an infidel; but, practically, no difference is generally made by the Mohammedan governments (chiefly the Turkish) in our day. Murder is punished with death, and no fine frees the culprit.

The Mosaic law of retaliation, in case of *intentional* wounds and mutilation, holds good also for Islam—that is (not, as has ignorantly been supposed, that the corresponding limb of the offender is to be cut off), a certain

proportionate fine in money is to be paid to the injured. The payment for any of the single limbs of the human body—e.g., the nose—is the full price of blood, as for a homicide; for a limb which is found twice, like hand or foot, half; for a finger or toe, the tenth part, etc. Women and slaves have smaller claims. Injuries of a dangerous or otherwise grievous nature pay the full price; those of an inferior kind, however, bring the perpetrator within the province of the lash or cudgel, which is supposed to have ‘come down from heaven, to be used by the judge for the promotion of virtue and duty.’

The Koran orders theft—of no less than the value of half-a-crown—to be punished by cutting off the chief offending limb, the right hand; the second theft is punishable by the loss of the left foot; the third, of the left hand; the fourth, of the right foot, etc.; but the ordinary punishments of imprisonment, hard labor, and the bastinado, have been substituted in our days. The property stolen must not, however, have been of easy access to the thief, nor must it have consisted of food, since he may have taken this to satisfy his hunger.

Unchastity in woman was, in the commencement of Islam, punished by imprisonment for life, for which afterward stoning was substituted in the case of a married woman, and a hundred stripes and a year’s exile in the case of an unmarried free woman; a slave to undergo only half of that punishment. Yet, it is necessary that he who accuses a ‘woman of reputation’ of adultery or fornication shall produce four (male) witnesses, and if he be not able to do so, he is to receive fourscore stripes, nor is his testimony ever after to be received, for he is considered an ‘infamous prevaricator’—unless he swear four times that he speaks the truth, and the fifth time imprecate God’s vengeance if he speak false. Yet, even this testimony may be overthrown by the wife’s swearing four times that he is a liar, and imprecating the fifth time the wrath of God upon herself, if he speak the truth. In the latter case, she is free from punishment; the marriage, however, is to be dissolved. Fornication in either sex is, by the law of the Koran, to be visited with a hundred stripes.

Infidelity, or apostasy from Islam, is a crime to be visited by the death of the offender, if he have been warned thrice without recanting. Severer still—that is, not to be averted by repentance or revocation of any kind, is the punishment inflicted for blasphemy—against God, Mohammed, Christ, Moses, or any other prophet. Instantaneous death is the doom of the offender; for if apostasy may be caused by error and misguidance, ‘blasphemy is the sign of complete wickedness and thorough corruption of the soul.’

A further injunction of the Koran, for the carrying out of which, however, the time has nearly gone by, is that of making war against the Infidels. He who is slain while fighting in defense and for the propagation of Islam is reckoned a martyr; while a deserter from the

holy war is held up as an object of execration, and has forfeited his life in this world as well as in the world to come. At first, all the enemies taken in battle were ruthlessly slain; later, it became the law to give the people of a different faith against whom war was declared the choice of three things: either to embrace Islam—in which case they became Moslems at once, free in their persons and fortunes, and entitled to all the privileges of Moslems; or to submit to pay tribute—in which case they were allowed to continue in their religion, if it did not imply gross idolatry or otherwise offended against the moral law; or to decide the quarrel by the fortune of war—in which case the captive women and children were made slaves, and the men either slain, unless they became converts at the last moment, or otherwise disposed of by the prince. The fifth part of the spoil belongs 'to God'—that is, the Sanctuary (Kaaba, etc.)—to the apostle and his kindred, to the orphans, the poor, and the traveller.

It is to be noted that the Koran is not a systematically arranged code, and that all the laws and regulations above enumerated, though contained in it, either bodily or, as it were, in germs—further developed by the Sunna (q.v.)—are to a great extent only mentioned in an incidental manner, thrown together and mixed up, often in the strangest manner, with the most heterogeneous dicta, dogmas, moral exhortations, civil and criminal laws, etc., and are to be considered principally as supplementary to the existing laws and regulations, which they either abrogated, confirmed, or extended, according to the pressing demand of circumstances during the Prophet's life. In cases for which subsequent ages found no written rules laid down by the Prophet, traditional oral dicta were taken as the norm, and, later still, precedents of the Khalifs were binding. Hence contradictions in theory and practice have crept in, according to the different traditions and decisions of the Imams or expounders of the Law, besides the various interpretations put on the book itself within the pale of the different Mohammedan sects. The secular tribunals, therefore, frequently differ in their decisions from the judicial tribunals; and the distinction between the written civil Law of the ecclesiastical courts and the common Law, aided by the executive power, is, fortunately for justice and civilization, becoming clearer every day.

That part of Islam, however, which has undergone (because not to be circumscribed and defined by doctors) the least changes in the course of time, and which most distinctly reveals the mind of its author, is also its most complete and its most shining part—we mean the ethics of the Koran. They are not found, any more than the other laws, brought together in one, or two, or three Surahs, but 'like golden threads' they are woven into the huge fabric of the religious constitution of Mohammed. Injustice, falsehood, pride, revengefulness, calumny, mockery, avarice, prodigality, debauchery, mis-

trust, and suspicion are inveighed against as ungodly and wicked; while benevolence, liberality, modesty, forbearance, patience and endurance, frugality, sincerity, straightforwardness, decency, love of peace and truth, and, above all, trusting in God, and submitting to His will, are considered as the pillars of true piety, and the principal signs of a true believer. Mohammed never taught that form of the doctrine of absolute predestination and 'fatality' which destroys all human will and freedom by teaching that the individual's deeds cannot alter one iota in his destiny either in this world or in the next. On the contrary, foolhardiness is distinctly prohibited in the Koran (ii. 196): caution is recommended: prayer, the highest ceremonial law of Islam, is modified in case of danger: it is legal to earn one's livelihood on Friday after prayer, and to shorten the readings in the Koran for the sake of attending to business. These instances show that the Moslem is not to expect to be fed pursuant to a Divine decree, whether he be idle or not. On the other hand, a glance at the whole system of faith, built on hope and fear, rewards and punishments, paradise and hell, both to be man's portion according to his acts in this life, and the incessant exhortations to virtue, and denunciations of vice, are sufficient to prove that aboriginal predestination, such as St. Augustine taught, is not in the Koran, where only submission to God's will, hope during misfortune, modesty in prosperity, and entire confidence in the Divine plans, are supported by the argument, that everything is in the hands of the Highest Being, and that there is no appeal against His absolute decrees.

And this is one instance of the way in which most of Mohammed's dicta have been developed and explained—both by sectarians and enemies within and without Islam—in such a manner that he has often been made to teach the very reverse of what he really did teach; and thus monstrosities now found in his creed, if carefully traced back to their original sources, will, in most cases, be seen to be the growth of later generations, or the very things that he abrogated. That, again, the worst side of his character, the often wanton cruelty with which he pursued his great mission, the propagation of his faith, should by his successors have been taken as a thing to be principally imitated, is not to be wondered at, considering the brilliant success which attended his policy of the bloody sword. Scarcely a century had elapsed after Mohammed's death before Islam reigned supreme over Arabia, Syria, Persia, Egypt, the whole of the n. coast of Africa, even as far as Spain; and notwithstanding the subsequent strifes and divisions in the interior of this gigantic realm, it grew and grew outwardly, until the Crescent was made to gleam from the spires of St. Sophia at Constantinople, and the war-cry 'Allah il Allah!' resounded before the gates of Vienna. From that time, however, the splendor and the power of Mohammedanism began to wane. Although

there are counted about 130 millions this day all over the globe who profess Islam, and although it is, especially at this present juncture, making great progress among the African races, yet the number of real and thorough believers is infinitely small; and since it has left off conquering, it has lost also that energy and elasticity which promises great things. Its future fate will depend chiefly, it may be anticipated, on the progress of European conquest in the East, and the amount of Western civilization which it will, for good or evil, import into those parts.

We cannot consider in this place what Islam has done for the general good of the race, or, more exactly, what was its precise share in the development of science and art in Europe. (See the special titles relative to these subjects—especially the biographical titles referring to men eminent in every branch of human knowledge who have issued from the ranks of Islam.) Broadly speaking, the Mohammedans—inheritors of ancient Asiatic science and art—may be said to have been the enlightened teachers of barbarous Europe from the 9th to the 13th c. It is from the glorious days of the Abbaside rulers that the real renaissance of Greek spirit and Greek culture is to be dated. Classical literature would have been irredeemably lost had it not been for the home that it found in the schools of the ‘unbelievers’ of the ‘dark ages.’ Arabic philosophy, medicine, natural history, geography, history, grammar, rhetoric, and the ‘golden art of poetry,’ schooled by the old Hellenic masters, brought forth an abundant harvest of works, many of which will live and teach as long as there will be generations to be taught.

Besides the Koran, the Sunna, and the native (Arabic, Persian, Turkish, etc.) writers on the foregoing subject, see, further, the works of the European scholars Maracci, Hyde, Prideaux, Chardin, Du Ryer, Reland, D’Herbelot, Sale, De Sacy, Hammer, Burekhardt, Sprenger, Burton, Muir, Garcin de Tassy, Lane, Weil, Geiger, Nöldeke.—See CALIPH: KORAN: MOHAMMED: MOHAMMEDAN SECTS: SHIITES: SUNNA.

MOHAMMEDAN SECTS: divisions among those professing the faith of Islam. ‘My community,’ Mohammed is reported to have said, ‘will separate itself into 73 sects; one only will be saved, all the others shall perish.’ This prophecy has been largely fulfilled. Even during the illness, and immediately after the death of the founder, many differences of opinion arose among his earliest adherents. The fundamental book of Islam left certain points undecided by the very fact of its poetical wording (see KORAN: MOHAMMEDANISM); and further, the peculiarity of the Arabic idiom at times allowed many interpretations to be put on one cardinal and dogmatic sentence. To add to this uncertainty, a vast number of oral traditions sprang up and circulated as an expansive corollary to the Koran. Political causes soon came to assist the confusion and contest, and religion

was made the pretext for faction-fights, which in reality had their origin in the ambition of certain men of influence. Thus 'sects' increased in far larger numbers even than the Prophet had foretold, and though their existence was short-lived in most instances, they yet deserve attention, if only as signs and tokens of mental activity, which, though fettered a thousand times by narrow and hard formulas, will break these fetters a thousand times, and prove its everlasting right to freedom of thought and action. These sects are notable as tokens also of the inherently divisive and schismatic effect of theology when it is taken as the substance or the chief aim of a religion.

The bewildering mass of these controversies largely theological or philosophical, has by the Arabic historians been brought under four chief heads or fundamental bases. The first of these relates to the divine attributes and unity. Which of these attributes are essential or eternal? Is the omnipotence of God absolute? If not, what are its limits? The second relates to the doctrine of God's predestination and man's liberty—a question of no small purport, and one which has been controverted in nearly all 'revealed' religions—How far is God's decree influenced by man's own will? How far can God countenance evil? and questions of a similar kind belonging to this province. The third is perhaps the most comprehensive 'basis,' and the one that bears most directly upon practical doctrines—viz., the promises and threats, and the names of God, together with various other questions relating chiefly to faith, repentance, infidelity, and error. The fourth concerns itself with the influence of reason and history on the transcendental realm of faith: To this head belong the mission of prophets, the office of Imam, or Head of the Church, and such intricate subtleties as to what constitutes goodness and badness; how far actions are to be condemned on the ground of reason or the 'Law;' etc.

One broad line, however, came to be drawn, in the course of time, among these innumerable religious divisions, a line that separated them all into orthodox sects and heterodox sects; orthodox being those only who adopted the oral traditions, or Sunna (see SUNNITES).

Much more numerous than the orthodox divisions are the heterodox ones. Immediately after Mohammed's death, and during the early conquests, the contest was chiefly confined to the question of the Imamatus. But no sooner were the first days of warfare over, than thinking minds began to direct themselves to a closer examination of the faith itself, for which and through which the world was to be conquered, and to the book which contained it, the Koran. The earliest germs of a religious dissension are found in the revolt of the Kharejites against Ali, in the 37th year of the Hedjrah (A.D. 659); and several doctors shortly afterward broached heterodox opinions about predestination and the good and evil to be ascribed to God. These new doctrines were boldly, and in a very advanced form, openly preached by Wásil Ibn

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Atâ, who, for uttering a moderate opinion in the matter of the 'sinner,' had been expelled from the rigorous school of Basra. He then formed a school of his own—that of the Separatists or Motazilites (q.v.), who, with a number of other 'heretical' groups, are variously counted as one, four, or seven sects.

The second great heretic group, the Sefatians (attributionists) held a precisely contrary view to that of the Motazilites. With them, God's attributes, whether essential or operative, or what they afterward called declarative or historical, i.e., used in historical narration (eyes, face, hand), anthropomorphisms, in fact, were considered eternal. But here, again, lay the germs for more dissensions and more sects in their own body. Some taking this notion of God's attributes in a strictly literal sense, assumed a likeness between God and created things; others giving it a more allegorical interpretation, without, however, entering into any particulars beyond the reiterated doctrine, that God had no companion or similitude. The different sects into which they split were, first, the Asharians, so called from Abul Hasan al Ashari, who, at first a Motazilite, disagreed with his masters on the point of God's being bound to do always that which is best. He became the founder of a new school, which held (1) that God's attributes are to be held distinct from His essence, and that any literal understanding of the words that stand for God's limbs in the Koran is reprehensible. (2) That predestination must be taken in its most literal meaning, i.e., that God preordains everything. The opinions on this point of man's free will are, however, much divided, as indeed to combine a predestination which ordains every act with man's free choice is not easy; and the older authors held it is well not to inquire too minutely into these things, lest all precepts, both positive and negative, be argued away. The middle path, adopted by the greater number of the doctors, is expressed in this formula: There is neither compulsion nor full liberty, but the way lies between the two; the power and will both being created by God, though the merit or guilt be imputed to man. Regarding mortal sin, it was held by this sect, that if a believer die guilty of it without repentance, he will not, for all that, always remain a denizen of hell: either God will pardon him, or the Prophet will intercede on his behalf, as he says in the Koran: 'My intercession shall be employed for those among my people who shall have been guilty of grievous crimes;' and further, that he in whose heart there is faith but of the weight of an ant, shall be delivered from hell-fire. From this more philosophical opinion, however, departed a number of other Sefatian sects, who, taking the Koranic words more literally, transformed God's attributes into grossly corporeal things, like the Mosshabehites, or Assimilators, who conceived God to be a figure composed of limbs like those of created beings, either of a bodily or spiritual nature, capable of local motion, ascent, or descent, etc. The

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notions of some actually went so far as to declare God to be 'hollow from the crown of the head to the breast, and solid from the breast downward; he also had black curled hair.' Another sub-division of this sect were the Jabarians, who deny to man all free agency, and make all his deeds dependent on God. Their name indicates their religious tendency, meaning 'Necessitarians.'

The third principal division of 'heretical sects' is formed by the Kharejites, or 'Rebels' from the lawful prince—i.e., Ali—the first of whom were the 12,000 men who fell away from him after having fought under him at the battle of Seffein, taking offense at his submitting the decision of his right to the caliphate (against Moawiyah) to arbitration. Their 'heresy' consisted, first, in their holding that any man might be called to the Imamatus though he did not belong to the Koreish, nor was even a freeman, provided he was a just and pious man, and fit in every other respect. It also followed that an unrighteous Imam might be deposed, or even put to death; and further, that there was no absolute necessity for any Imam in the world.

For the fourth principal sect, the Shiites, or 'Sectaries,' followers of Ali Ibn Abi Tâleb, see SHIITES.

It remains only to mention a few of the many pseudo-prophets who arose from time to time in the bosom of Islam, drawing adherents around them, and threatening to undermine the church founded by Mohammed, by either declaring themselves his legal successors, or completely renouncing his doctrines. The first, and most prominent, was Mosaylima (q.v.). Next stands Al-Aswad, originally called Aihala, of the tribe of Ans, of which, as well as of that of a number of other tribes, he was governor. He pretended to receive certain revelations from two angels, Sohaik and Shoraik. Certain feats of legerdemain, and a natural eloquence, procured him followers, by whose aid he made himself master of several provinces. A counter-revolution, however, broke out the night before Mohammed's death, and Al-Aswad's head was cut off; whereby an end was put to a rebellion of exactly four months' duration, but already assuming large proportions. In the same year, 11 Hedjrah (A.D. 633), but after Mohammed's death, a man named Toleiha set up as prophet, but with very little success. He, his tribe, and followers were met in open battle by Khalid, at the head of the troops of the Faithful, and being beaten, they all finally submitted to Islam.

A few words ought also to be said regarding the 'Veiled Prophet,' Al-Mokanna, or Borkai, whose real name was Hakim Ibn Hashem or Hakim-ben-Allah (q.v.), at the time of Al-Mohdi, third Abbaside caliph. He used to hide the deformity of his face (he had also but one eye) by a gilded mask; which his followers explained by the splendor of his countenance being too brilliant (like that of Moses) to be borne by ordinary mortals. Being a proficient in jugglery besides, which went for the power of working miracles, he soon drew many followers.

MOHAVE DESERT—MOHAWK.

At last he arrogated the office of the Deity itself, which by continual transmigrations from Adam downward, had come to reside in the body of Abu Moslem, governor of Khorassan, whose secretary this new prophet had been. The caliph, finding him growing more and more formidable every day, sent a force against him, which finally drove him back into one of his strongest fortresses, where, as the story is, he first poisoned and then burned all his family; after which he threw himself into the flames, which consumed him completely, except his hair. He had left a message, however, to the effect that he would reappear in the shape of a gray man riding on a gray beast, and many of his followers for many years expected his reappearance. They wore, as a distinguishing mark, nothing but white garments. He died about the middle of the 2d c. Hedjrah.

For the Karmathians and the Ismailis, see those titles. We can scarcely enumerate among the prophets Abul Teyeb Ahmed Al-Motanebbi, one of the most celebrated Arabic poets, who mistook, or pretended to mistake, his poetical inspirations for the divine afflatus, and caused several tribes to style him prophet, as his surname indicates, and to acknowledge his mission. The gov. of his province, Lûlû, took the promptest steps to stifle any such pretensions in the bud, by imprisoning him, and making him formally renounce all absurd pretensions to a prophetic office. The poet did so with all speed. He was richly rewarded by the court and many princes for his minstrelsy, to which henceforth he clung exclusively; but the riches he thus accumulated became the cause of his death. Robbers attacked him while he was returning to his home in Kufa, there to live on the treasure bestowed upon him by Adado'ddawla, Sultan of Persia.—The last of these new prophets to be mentioned is Baba, who appeared in Amasia, in Natolia, in 638 Hedjrah (A.D. 1260), and who had immense success, chiefly with the Turkmâns, his own nation, so that at last he found himself at the head of nearly a million men, horse and foot. Their war-cry was, God is God, and Baba—not Mohammed—is his prophet. It was not until both Christians and Mohammedans combined against him for self-defense, that this new and formidable power was annihilated, its armies being routed and put to the sword, while the two chiefs were decapitated by the executioner.

MOHA'VE DESERT: see AMERICA.

MOHAWK, *n.* *mō'hawk*, or МОНОК [from an Amer. Indian tribe of that name]: at the beginning of the 18th c., a name applied to a class of ruffians in London who prowled about at night committing outrages.

MO'HAWK RIVER: stream in e. N. Y., named from a tribe of Indians. It rises in Oneida co., and flows eastward into the Hudson at Waterford, 10 m. above Albany. It is 135 m. long, and has numerous and picturesque waterfalls, especially at Little Falls, Cohoes, and Waterford, affording abundant water-power.

MOHAWKS—MOHILEV.

MOHAWKS, *mō'hawks*, or MO'HAWK INDIANS: tribe of the Iroquois: see INDIANS, AMERICAN.

MOHICANS, *mō-hē'kanz*, or MOHEGANS, *mō-hē'gan*, or MAHICANNI: formerly a powerful and warlike sub-tribe of N. Amer. Indians, of the great Algonquin family, which, in the 17th c., inhabited the territory n.n.w. of Long Island Sound, and e. of the Hudson river, now included in the states of New York, Connecticut, and Massachusetts. Being compelled to give way to the conquering Iroquois confederacy, they retired to the valley of the Housatonic river in Conn., and were consequently one of the first tribes who came into collision with, and were dispossessed of their territory by the early British settlers. They subsequently lived dispersed among the other tribes, and nearly all traces of them have now disappeared. Their name has become widely known through J. Fenimore Cooper's celebrated novel, *The Last of the Mohicans*.

MOHILEV, or MOGILEV, *mo-čhē'lěv*: government of European Russia, between Minsk and Smolensk; 18,500 English sq. m. The inhabitants are mostly Rusniaks, though there are also many Russians, Germans, Jews, and even Bohemians. The country is generally a plain, with occasional undulation; the soil is very fertile, and the climate agreeably mild. Agriculture, arboriculture, and horticulture have been brought to high development. The natural pasturage is of fine quality, and affords abundant nourishment to immense herds of cattle. The forests are extensive. The country is watered by the Dnieper and its numerous affluents, which give communication with the Black Sea ports, and means of transit for corn, timber, and masts, of which last large quantities are annually floated down to Kherson. Bog iron ore is found in abundance. The inhabitants are noted for activity and industry; and M., from its great natural advantages, has now become one of the richest provinces of Russia.

In early times, M. belonged to the territory of the Russian prince of Smolensk, but was conquered by the Grand Duke of Lithuania; and was, with Lithuania, united to the kingdom of Poland. In 1772, it was seized by Russia at the first partition of Poland; and 1796, was joined to the govt. of Vitebsk, under the name *White Russia*; but since 1802, it has formed a separate government. Pop. (1890) 1,387,000; (1897) 1,708,041.

MOHILEV, or MOGI'LEV: capital of the govt. of M. in European Russia, and one of the finest towns of Russia; in the centre of the govt., on the right bank of the Dnieper, 100 m. s.w. of Smolensk. It is the seat of a Greek abp., and of the Rom. Cath. primate of Russia and Poland, besides being the favorite residence of many of the Russian nobility. It possesses a fine Greek cathedral, built 1780, 20 Greek, one Lutheran, and 4 Rom. Cath. churches, several synagogues, and a variety of religious, educational, and charitable institutions. Its streets are wide, straight, and well paved, and there is a fine promenade bordered with trees, whence a beautiful view of the valley of the Dnieper is obtained. One-third of the people are Jews. There is large export trade to the chief ports of the Baltic and Black Seas. Pop. (1880) 40,431; (1891) 45,311; (1897) 43,106.

MOHILEV, or MOGI'LOW: district town on the s.w. frontier of the govt. of Podolia, Russia; on the left bank of the Dniester, which separates it from the govt. of Bessarabia. It carries on active trade with the adjacent Russian provinces, and to some extent with Galicia and Roumania. The climate is so mild, that silk and other products of warm climates are extensively produced. Pop. (1880) 18,130; (1890) 20,975.

MÖHLER, mö'ler, JOHANN ADAM: distinguished polemical divine of the Rom. Cath. Church: 1796, May 6—1838, Apr. 12; b. Igersheim, Würtemberg; of humble parentage. He received his early education at the Gymnasium of Mergentheim, whence, in his 17th year, he was transferred, for the higher studies, to the Lyceum of Ellwangen; and soon afterward entered on the theological course in the Univ. of Tübingen. He received priest's orders 1819; and for a short time was in missionary duty; but, 1820, he returned to college-life, and was engaged as classical tutor; but, 1822, the offer of a theological appointment in the Univ. of Tübingen, finally decided his choice of the study of divinity, and 1823, he entered on his new position. In 1828 he received the degree doctor of divinity, and was appointed ordinary prof. of theology. His earliest publication was a treatise *On the Unity of the Church* (1825), followed 1827 by a historico-theological essay on *Athanasius and the Church of His Time, in Conflict with Arianism*. But his reputation both contemporary and posthumous, rests mainly on his well-known *Symbolism; or the Doctrinal Differences between Catholics and Protestants, as represented by Their Public Confessions of Faith* (1832). This remarkable book at once fixed the attention of the theological world. It passed through five large editions in six years. It was translated into all the leading languages of Europe, and drew forth numerous criticisms and rejoinders, the most considerable of which is that of Dr. F. C. Baur (q.v.), 1833. To this M. replied 1834, by *Further Researches into the Doctrinal Differences of Catholics and Protestants*. The polemical bitterness evoked by these controversies made it desirable that M. should leave the Univ. of Tüb-

ingen. He was invited to Breslau, also to Bonn, but ultimately selected (1835) the Univ. of Munich, then in the first flush of its efficiency, under King Louis. His first appointment was nominally the chair of biblical exegesis, but he really applied himself to church history, in which his opening course was eminently successful; but, unhappily, a naturally delicate constitution began to give way under the constant fatigues of a student's life; and though he continued, under all these disadvantages, to maintain and to add to his reputation, and though 1837 the invitation to the Bonn professorship was renewed in still more flattering terms, he gradually sank under consumption, and died 1838. His miscellaneous works were collected and published posthumously, 2 vols. 8vo. (1839-40), by his friend, the now celebrated Dr. Döllinger. M. may be regarded as at once the most acute and the most philosophical of the modern controversialists of his church. He deals more, however, with the exposition of the points and the grounds of the doctrinal differences of modern sects, than with the discussion of the scriptural or traditional evidences of the peculiar doctrines of any among them.—M.'s thought was liberal, and his spiritual sympathy wide, and his *Symbolism* is singularly able and suggestive; yet his statement of Rom. Cath. doctrine is not fully accepted by his church; and Protestants consider that his strength was given rather to exposing the inconsistencies of the reformers and the weaknesses of various sects than to a discussion of the Reformation itself as a great movement of religious thought.

MO'HONK LAKE: mountain resort, remarkably picturesque and interesting, including an extensive area around a small lake near the summit of Sky-Top, in the Shawangunk Mountains, Ulster co., N. Y.; 15 m. w. of Poughkeepsie on the Hudson, 6 m. w. from New Paltz (on a branch of West Shore railroad), 88 m. from New York. Like the neighboring resort (9 m. distant), Lake Minnewaska (q.v.), M. L. presents a startling and impressive scene of massive rocks heaped in wonderful confusion, overhanging cliffs, and summits commanding views of six states. There are 35 m. of admirable roads within the estate and an excellent hotel with large accommodations. The lake itself is about half a mile long, and a few hundred ft. wide.

MOHUR, n. *mō'hēr* [Pers. *muh*r, a gold coin]: a gold coin of British India, equal to 15 or 16 rupees.

MOHURRUM, n. *mō-hūr'rūm* [Ar. *Muharram*, sacred, forbidden]: a Mohammedan festival in memory of Hassan and Houssein, nephews of the prophet; the first month of the Mohammedan year.

MOIDORE, n. *moy'dōr* [F. *moidore*, a spelling of the Port. *moeda d'ouro*, money of gold—from L. *monēta*, money; *de*, of; *aurum*, gold]: former gold coin of Portugal, of the value of 4,800 reis, or nearly 27s. sterling (abt. \$6.57). It was called also *Lisbonine*.

MOIETY—MOISSAC.

MOIETY, n. *moy'ě-tĭ* [F. *moitié*, half—from L. *mediĕ-tātem*, the place in the middle]: the half; one of two equal parts; a part.

MOIL, v. *moyl* [OF. *moiller*; F. *mouiller*, to wet to soak—from a supposed mid. L. *mollĭārĕ*, to soften—from L. *mollis*, soft: It. *mollare*, to soak]: in *OE.*, to wet; to daub with dirt; to pollute; to wallow.

MOIL, v. *moyl* [see **MOIL** 1, and comp. Gr. *molos*, labor, toil; L. *molĭor*, I toil; Gael. *maille*, slowness, painful effort]: to toil or labor; to drudge. **MOIL'ING**, imp. **MOILED**, pp. *moyld*. **TOIL AND MOIL**, very hard and apparently hopeless labor. *Note.*—**MOIL** 2 is probably only a secondary application of **MOIL** 1, from the laborious efforts of one struggling through wet and mud, or from the frequent dirty state of the person who labors hard—see Wedgwood and Skeat.

MOIRE, n. *mwawr* [F. *moire*: formerly *mohère*, supposed from English *mohair*, itself prob. of eastern origin (see **MOHAIR**)]: clouded or mottled appearance on metallic or textile fabrics; watered or clouded silk; mohair. The silks for *moire* must be broad and of good substantial make; thin and narrow pieces are not suitable: they are wetted, and then folded with particular care, to insure the threads of the fabric lying all in the same direction, and not crossing each other, except as in the usual way of the web and the warp. The folded pieces of silk are then submitted to enormous pressure, generally in a hydraulic machine. By this pressure, the air is slowly expelled, and in escaping, draws the moisture into curious waved lines, which leave the permanent marking called *watering*.—The same process has been applied to woolen fabrics called *Moreen*, which is only an alteration of the word *moire*. **MOIRE-ANTIQUE**, superior style of watered silk made to resemble the materials worn in olden times. **MOIRE-MÉTALLIQUE**, *-mā'tāl-lĕk'* [F.]: frosted or crystalline appearance produced for ornamental purposes on tin-plate; the tin-plate thus prepared. This appearance, as of frost on windows, is produced by dipping plates, in a heated state, into nitromuriatic acid, and then washing with water, to remove the acid. When dry, the plates are varnished or lacquered, and have a pretty effect. The cheapness and ease of the process have made it very common for inferior articles in tin.

MOISSAC, *mwâ-sâk'*: town of France, dept. of Tarn-et-Garonne, on the river Tarn, 15 m. n.w. of Montauban. The church of St. Pierre dates from 1100, and contains some excellent carvings and curious fantastic sculptures. **M.** is the centre of important trade in grain. Pop. 6,000.

MOIST—MOLASSE.

MOIST, a. *moyst* [OF. *moiste*; Milan. *moisc*, wet, damp: connected with L. *mustĕŭs*, new, fresh—from *mustum*, new wine]: damp; wet in a small degree; juicy; containing water or other liquid; in OE., fresh or new. **MOISTNESS**, n. *-nĕs*, dampness; a slight degree of wetness. **MOISTEN**, v. *moys'n*, to wet in a small degree; to damp. **MOISTENING**, imp. *moys'nĭng*. **MOISTENED**, pp. *moys'nd*. **MOISTENER**, n. *moys'nĕr*, he or that which moistens. **MOISTURE**, n. *moys'tŭr* or *-chŭr*, a moderate degree of wetness; humidity; dampness. **MOISTURELESS**, a. *-lĕs*, without moisture.

MOKAH, n. *mō'ka* [Turk.]: title of a doctor of law in Turkey.

MOKANNA, *mo-kān'na*, or **ATHA-BEN-HAKIM**: see **HAKIM-BEN ALLAH**: **MOHAMMEDAN SECTS**.

MOLA, or **MOLA DI BARI**, *mō'lā dē bâ'rĕ*: city and seaport of the Italian province of Bari, delightfully situated among gardens and olive groves, on the Adriatic, 13 m. from Bari. It contains fine churches and other edifices, and excellent streets. From all accounts, it seems to have very little trade of any kind. Pop. 12,181.

MOLAR, n. *mō'lĕr* [L. *molāris*, a millstone—from *mola*, a mill: It. *molare*; F. *molaire*, molar]: a double tooth or grinder: **ADJ.** grinding; used for grinding, as a *molar* tooth.

MOLASSE, or **MOLLASSE**, n. *mō-lās'* [F. *mollasse*, flabby, flimsy—from F. *mol*; L. *mollis*, soft]: in *geol.*, extensive Miocene or Middle Tertiary deposit, occupying the central lake-region of Switzerland between the Alps and the Jura. It consists chiefly of a loose sand, but at the foot of the Alps it usually takes the form of a conglomerate called 'Nagel-flue,' which is said to attain the astonishing thickness of 6,000 to 8,000 ft. in the Righi, near Lucerne, and in the Speer, near Wesen. The M. contains a few shells and some vegetable remains, among which are several palms.

MOLASSES—MOLAY.

MOLASSES, n. *mō-lās'ēz* [F. *mélasse*; It. *melassa*, *molasses*—from Sp. *melaza*, the dregs of honey, the drainings of sugar: Port. *melaço*, molasses]: liquid which drains from raw sugar during the process of granulation and cooling; treacle: see SUGAR.

MOLAY, *mo-lā'*, JACQUES DE: 1244–1314; b. Burgundy. Nothing is known of his early life, except that he joined the order of Knights Templars, and became grand master about 1298. At that time the former splendid success of the various religious orders had forsaken them. Palestine was again in the power of the Mohammedans, and the Templars had retired to Cyprus, whence they in vain appealed to Europe for aid in reconquering the Holy Land. Then De M. entered into alliance with the Mogul Tartars in their war against Syria and Egypt, commanding one wing of their army, with which he invaded Syria and captured Jerusalem 1299. Next year, however, the Tartars were utterly defeated, and the Templars again driven out of Jerusalem. They retired to the island of Tortosa, near Tripoli; whence, 1302, they were driven to Cyprus. Philip IV. of France, fearing the power and influence of the Templars and Hospitalers, and lusting after their immense wealth, determined on their destruction. Pretending to want to organize another crusade, he summoned the heads of the orders to meet him. De M. landed in s. France at the head of a retinue of 60 chosen knights, and a train of pack-mules laden with treasure. His march through the country, and into Paris, where he arrived 1306, Aug., was like the triumphal procession of a monarch. This only increased Philip's fear and cupidity. Rumors damaging to the Templars had been spread. De M. demanded an investigation from Pope Clement at Poitiers. Formal charges were made, of a heinous nature, to the king, who secretly and simultaneously arrested every Templar in France 1307, Oct. 13. They were charged with denying Christ; adoring an idol; infamous kisses at their initiation; omission of the words of consecration in the mass; and unnatural crimes. Under inhuman torture many of the order confessed these charges to be true; among others De M. is said to have so confessed. The pope at first protested against Philip's arrogant proceeding without his authority; but finally fully sanctioned all. De M. was chained in a dungeon until 1314, when he was burned at the stake on an island of the Seine at Paris, after having declared his former confession false, and his order innocent of the charges made against it. He was the last grand master of the Templars. See **TEMPLARS**.

MOLD.

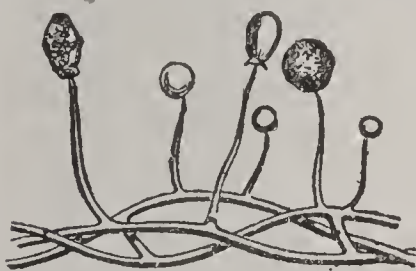
MOLD, n. *möld* [Dut. *mul*, dust; *mullen*, to crumble away: Goth. *mulda*, dust: Icel. *mold*, earth; *molða*, to commit to earth; *molna*, to molder away]: fine soft earth such as constitutes soil; friable earth; garden-soil; earth or material of which anything is formed. **MOLDER**, v. *möld'ér*, to turn to dust, or crumble by natural decay; to waste away gradually. **MOLD'ERING**, imp.: **ADJ.** turning to dust; wasting or crumbling away. **MOLDERED**, pp. *möld'érd*: **ADJ.** turned to dust; wasted away. **MOLDERY**, a. *möld'ér-ĭ*, partaking of the nature of mold. **MOLD-BOARD**, the broad concave part of a plow which receives and lays over the furrow-slice cut off by the coulter, and raised up by the share. **MOLD-WARP**, n. *-wawrp* [AS. *molde*, earth; *weorpan*, to throw or cast]: a mole, so named from its casting up earth.

MOLD, n. *möld* [Bav. *mauckelen*, to smell close and musty; *maunken*, to look sour, to smell ill: Dut. *monckelen*, to look gloomy or sour: Dan. *muggen*, sulky, musty]: the thread-like fungi which form on bodies, particularly when exposed to warm or damp air, and which prey upon them and destroy their original properties (see below): **V.** to cause to contract mold; to become moldy. **MOLD'ING**, imp. **MOLD'ED**, pp. **MOLD'Y**, a. *-ĭ*, covered with mold. **MOLD'INESS**, n. *-něs*, state of being moldy; the minute fungi which appear on organic bodies under certain conditions. **IRON-MOLD**: see **IRON**.

MOLD, n. *möld* [F. *moule*; OF. *modle*; Sp. *molde*, a mold, a model: It. *modello*, a model—from L. *modŭlus*, a small measure]: that in which anything is cast and receives its form; shape or bed in which metal and other castings are made; the matrix; a shape for confectiōnery; the cast or form given; model or pattern from which workmen execute moldings, ornaments, etc.: **V.** to form into a particular shape; to fashion; to knead. **MOLD'ING**, imp. (see **FOUNDING**): **N.** anything formed in a mold; an ornamental form in wood or stone (see **MOLDINGS**): the contour given to the angles of cornices, capitals, window-jambs, etc.; a small border or edging to a panel, or to a picture-frame. **MOLD'ED**, pp. **MOLD'ABLE**, a. *-ă-bl*, that may be molded or formed. **MOLD'ER**, n. *-ér*, one who molds or forms into shape.

MOLD, *möld* (anciently *Monte Alto*; Welsh, *Wyddgrug*): parliamentary borough in the county of Flint, Wales, on the Alun, 12 m. w.s.w. of Chester. Though Flint is the county town, the assizes and quarter-sessions for the county are held here. The town possesses a good market, a fine old church, and several dissenting chapels. It is connected with England by a branch of the Chester and Holyhead railway. The neighborhood abounds in mineral wealth, coal and lead being the principal product; it has also numerous interesting relics of antiquity—e.g., so-called Druidic circles, Roman roads and encampments, Saxon earthworks, an eminence called *Bryn Beili* (formerly surmounted by a castle), and a castellated building known as the Tower of Rheinallt ab Gruffydd, the two latter having been scenes of frequent contentions between the English and Welsh. Many old families have mansions in the neighborhood, whose pleasing variety of scenery renders it attractive. Pop. of parliamentary borough (1881) 4,320; (1886) 5,055.

MOLD, or **MOLDINESS**: common name of many minute fungi which appear, often in crowded multitudes, on animal and vegetable substances, either in a decaying or in a living but morbid state. To the naked eye, they often seem like patches or masses of fine cobweb, and are discovered by the microscope to consist of threads more or less distinctly jointed, sometimes branched. Some species of *M.* occur on many different substances; others seem peculiar to substances of particular kinds, as decaying pears, decaying gourds, etc. Some of the



Common Mold (*Mucor mucedo*), highly magnified.

molds belong to the sub-order of fungi called *Physomyces*: see **FUNGI**. One of these is the **COMMON M.** (*Mucor mucedo*), plentifully found on fruit, paste, preserves, etc., in incipient decay, whose progress it hastens. It consists of cobweb-like masses of threads, from which rise many short stems, each bearing at the top a roundish membranous blackish spore-case.—A nearly allied, also very common species, is *Ascophora mucedo*, which forms a bluish *M.* on bread. From a spreading cobweb-like bed rise long slender branches, terminated by spore-cases, of which the vesicle collapses into the form of a little *pileus*.—An interesting species of *M.*, remarkable for luxuriance and beauty of colors—at first white, then yellow, with orange spore-cases, then shining green or olive, and with threads often several inches long—grows on fatty substances.—Other species of *M.* are ranked among *Hyphomyces*, a sub-order of *Fungi*, having a floccose thallus and naked sporés. One of these is the **BLUE M.** (*Aspergillus glaucus*), which imparts to cheese a flavor agreeable to epicures, and perhaps marks it as in a condition most suitable for promoting the digestion of other aliments, of which epicures eat too much. Advantage is often taken

of the fact, that a small portion of cheese affected with *M.* will speedily infect sound cheese into which it may be introduced. It is one of the few cases in which the propagation of these fungi is ever desired and sought after by man.—SNOW *M.* (*Lanosa nivalis*) is found on grasses, and especially on barley and rye beneath snow, often destroying whole crops. It appears in white patches of a foot or more in diameter, which finally become red as if dusted with red powder.

Even living animals are liable to be injured by fungi of this kind. Silk-worms are killed in great numbers by one called MUSCARDINE (q.v.), or SILKWORM ROT. Such fungi are sometimes developed on the mucous membrane and in internal cavities of vertebrated animals; and on the bodies of invertebrated animals, as the common house-fly, which, in the end of autumn, when it becomes languid, often dies from this cause. Even strongly-scented substances, if moist, are liable to be attacked by *M.* of one kind or other; nor are strong poisons, either animal or vegetable, a sufficient safeguard. *Ascophora mucedo* springs up readily in paste full of corrosive sublimate; and the mycelium of molds is found in strong arsenical solutions. The only sure preventive of *M.* is dryness. Many of the molds vegetate in liquids, but do not attain their perfect development, appearing only as filamentous and flocculent mycelia. The *Vinegar Plant* (q.v.) is an instance of this kind.

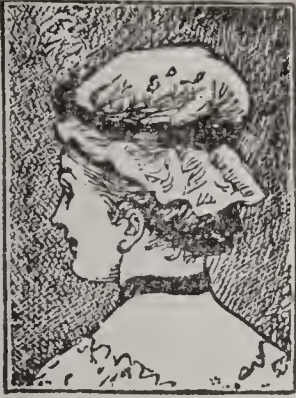
Mildews and Molds are very nearly allied.

The rapidity with which these fungi are produced is marvellous. 'In favorable circumstances, a plant will pass through every stage of growth to perfect maturation of its seeds in less than two days, the threads which sustain the ripe sporangia being so long, and yet so delicate, as to make it a marvel that they can remain erect.'—(*Berkeley*).

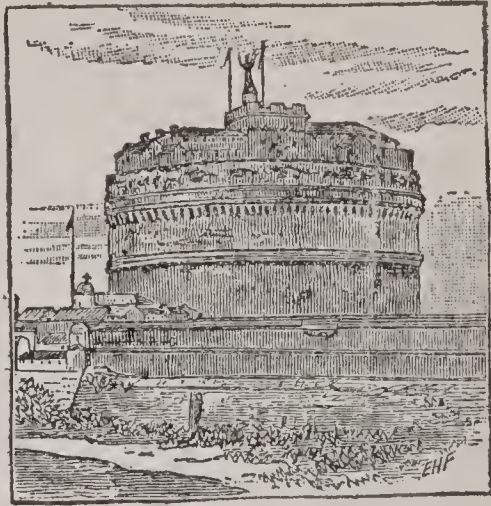
MOLDAU, *mōl'dow* (Bohemian, *Vitava*): chief river of Bohemia, and an important tributary of the Elbe. It rises in the Böhmerwald Mountains, on the s.w. frontier 3,750 ft. above sea-level, and flows s.e. to Hohenfurth, where it bends n. to its confluence with the Elbe opposite Melnik, after a course of 276 m. Its course to the point of confluence is longer than that of the Elbe, and the navigation of that river is greatly facilitated by the body of water which it contributes. It receives on the left, the Wotawa and the Beraun; and on the right, the Luschnitz and the Sazawa. The chief towns on its banks are Krumau, Budweis, and Prague. It becomes navigable from Budweis.

MOLDAVIA, *mōl-dā'vê-a*, AND WALACHIA, *wōl-lā'kê-a*: two states forming the so-called *Danubian Principalities*, which, since 1861, Dec. 23, have been united under one prince and one administration: see ROUMANIA.

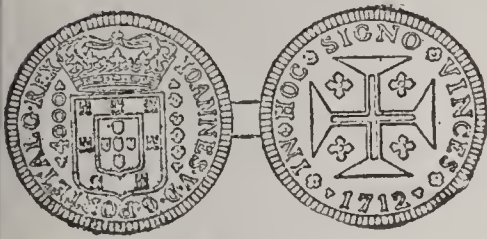
MOLDER, MOLDERING: see under MOLD 1.



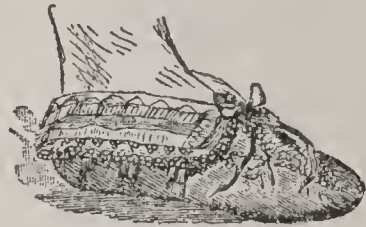
Mob-cap.



Mole.



Moidore.



Moccasin.



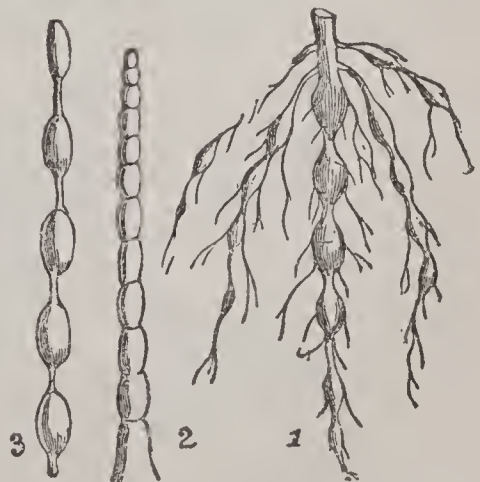
Monadelphous Flower.



Monandria.



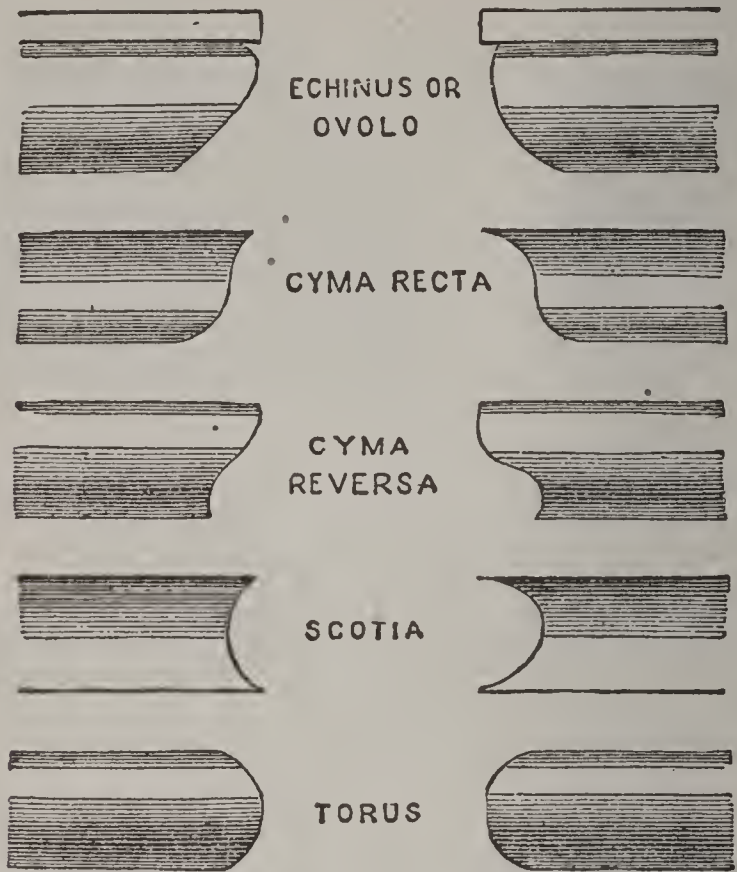
Diana Monkey (*Cercopithecus Diana*).



Moniliform.—1. Moniliform root of *Pelargonium*; 2 and 3. Moniliform hairs (*Tradescantia* and *Mirabilis*).

MOLDINGS.

MOLDINGS: curved and plane surfaces used as ornaments in cornices, panels, arches, etc., and in all enriched apertures in buildings. In classic architecture the M. are few in number, and definitely fixed in their forms.



Classic Moldings.

There are eight kinds of these regular M., viz., the Cyma, the Ovolo (or Echinus), the Talon, the Cavetto, the Torus, the Astragal, the Scotia, and the Fillet (q.v.); and each of these M. has its proper place assigned to it in each order: see COLUMN. In Gothic architecture, and all other styles, the M. are not reduced to a system as in the Greek and Roman styles, but may be used in every variety of form at the pleasure of the artist. Certain forms generally prevail at one period in any style.



Various Moldings.

Thus, in Gothic architecture, the date of a building may in many instances be determined by the form of the M. The Norman M. were very simple in outline, and fre-

quently enriched with the zigzag and billet ornaments. Fig. 1 is a common Norman form.

In the early English style, also, the M. are simple in outline, usually arranged in rectangular divisions, as in fig. 3, and consist of alternate rounds and hollows. In late examples of this style, the fillet was introduced (fig. 2), and led to the more elaborate form of M. during the Decorated period (fig. 4).

The M. of the Perpendicular style are generally flatter and thinner than the preceding, and have large hollows separated by narrow fillets, producing a meagre effect.

Each of these styles has its peculiar ornaments and style of foliage; and when these are used with the M., there is no difficulty in determining the approximate date of a building.

MOLDWARP: see under MOLE 3.

MOLE, n. *mōl* [Ger. *mahl*, a stain, a spot: Goth. *mail*, a mark: Scot. *mail*, a spot in cloth: Sw. *mal*, a mark: L. *macūla*, a spot or blemish]: spot or permanent mark on some part of the human skin: see NÆVUS.

MOLE, n. *mōl* [F. *mole*, a bank or causeway on the sea-side—from L. *mōlēs*, a huge mass or pile: It. *mole*]: a massive work of stones formed in the sea to protect a harbor from the violence of the waves; a huge shapeless mass.

MOLE, n. *mōl* [Dut. *mol*, a mole: Ger. *maulwurf*; Icel. *moldvarpa*, so named from its habit of casting up little hillocks of mold or earth]: small animal which burrows in the ground and throws up mold or earth (see below). MOLE-BAT, a lumpy sea-fish. MOLE-CAST, a mole-hill. MOLE-EYED, nearly blind. MOLE-HILL, a little hillock thrown up by moles; anything very small, or of infinitely less importance than represented, as, 'to make a mountain of a mole-hill. MOLE-TRACK, the underground course of a mole. MOLDWARP, n. *mōld'-wawrp* [OE. *molde*, mold, and *werpen*, to throw up]: in OE., the name of which *mole* is the shortened form.

MOLE, n. *mōl* [L. *mola*, a false conception: It. *mola*: F. *mole*]: in med., a mass of fleshy matter generated in the uterus.

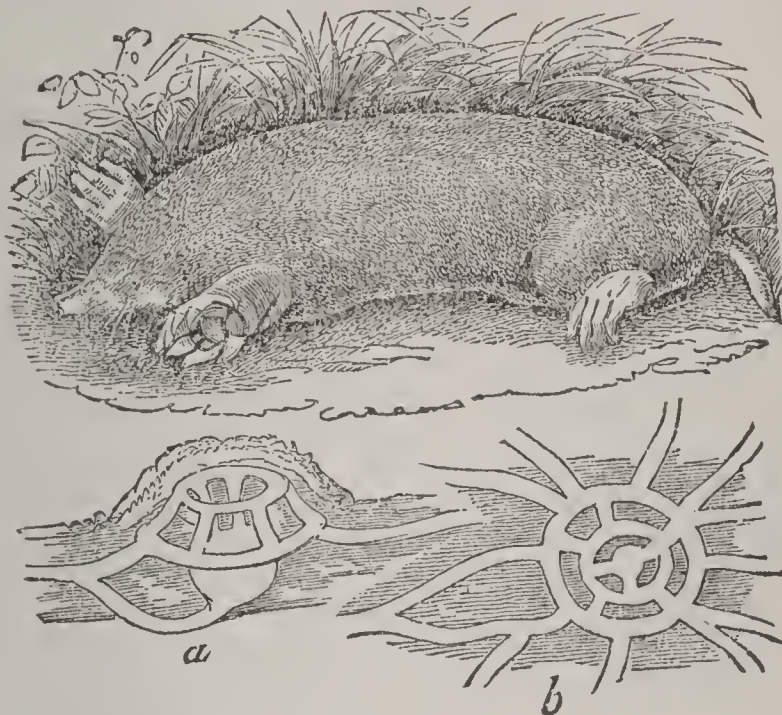
MOLE (*Talpa*): genus of quadrupeds of order *Insectivora*, family *Talpidae*. All the *Talpidae* live chiefly underground, and their structure is adapted to their mode of life. In their general form, the character of their fur, the shortness of their limbs, the great muscular strength of the foreparts and great breadth of the forepaws, the elongated head, the elongated and flexible snout, the smallness of the eyes, and the complete concealment of the ears, they all resemble the COMMON M. (*T. Europæa*), with which they nearly agree also in the nature of their food, their mode of seeking it, their dentition, and the shortness of their alimentary canal.—The Common M. is abundant in most parts of Europe, except the utmost north and utmost south. Instead of its or-

MOLE.

dinary uniform black color, it is occasionally found yellowish white, or gray, and even orange. Its silky or velvety fur lies smoothly in every direction, the short hairs growing perpendicularly from the skin—a peculiarity which preserves it clean as the animal moves either forward or backward in its subterranean galleries. The forepaws are not only very broad, but are turned outward, for better throwing back the earth in burrowing: they are terminated by five long and strong claws. The phalangeal bones are remarkable for breadth, and an elongated bone of the carpus gives additional strength to the lower edge of the paw. The two bones of the forearm are fastened together. The shoulder-blades and the clavicles are very large; and the sternum has an elevated ridge as in birds and bats, for the attachment of powerful muscles. The muscles which move the head also are very powerful, and the servical ligament is even strengthened by a peculiar bone; the M. making much use of its flexible snout in burrowing. The hinder limbs are comparatively feeble, and the feet small, with five toes. The eyes are black and very small, capable of being partially retracted and exerted. The senses of hearing, taste, and smell are very strongly developed. The cutting-teeth are very small and sharp; the canines long and sharp; the true molars broad, with many sharp conical elevations. This dentition adapts the animal for feeding not only on worms and grubs, but also on frogs, birds, and small quadrupeds, which accordingly are its occasional prey, though earthworms are its chief food. The M. is excessively voracious; digestion is rapid, and no long interval can be endured between meals, hunger soon ending in death. When pressed by hunger, it will attack and devour even one of its own kind; and its practice is immediately to tear open the belly of any bird or quadruped which it has killed, and, inserting its head, to satiate itself with the blood. In eating earthworms, it skins them with remarkable dexterity. In quest of them, it works its way underground, throwing up the earth in mole-hills; more rarely in the fine nights of summer it seeks them on the surface of the ground, when it is itself liable to be picked up by an owl equally in want of food. The habitation of the M. is of very remarkable construction: a hillock of earth larger than an ordinary mole-hill, and containing two circular galleries, one above the other, with five connecting passages, and a central chamber which has access to the upper gallery by three passages; while about nine passages lead away from the lower gallery in different directions. The end of a passage entering a gallery on one side is never opposite to the end of a passage entering on the other. To afford all facility of escape in case of any alarm, a passage leads at first downward from the central chamber, and then upward again till it joins one of the high-roads which the M. keeps always open, which are formed by pressing the earth till it becomes smooth and compact, and are not marked by any mole-hills thrown up, and

MOLE.

which not only serve for escape when necessary, but lead to those parts of the creature's appropriated domain where the ordinary mining for worms is to be prosecuted. The nest in which the female *M.* produces her young is not this habitation, but is formed generally under a mole-



Mole (*Talpa Europæa*):

a, vertical section of the habitation of the mole; *b*, plan of ditto.

hill rather larger than usual, where two or three runs meet, and is lined with leaves and other warm materials. The *M.* breeds both in spring and autumn, and generally produces four or five young at a birth. The attachment of the parent moles seems to be strong, but transitory.

It has been sometimes alleged that moles eat vegetable as well as animal food, and that they are injurious to farmers, by devouring carrots and other roots; but it appears rather that they gnaw roots only when in the way of their mining operations, or perhaps, also, in quest of grubs which they contain. Moles are generally regarded as a pest by farmers and gardeners, owing to the injury which mole-hills do to lawns and pastures, the burying up of young plants, and the disturbance of their roots. But they are certainly of use in the economy of nature in preventing the excessive increase of some other creatures; and probably also contribute to the fertility of some pastures, by the continual tillage which they carry on. Mole-traps of various kinds are in use, which are planted, if the mole-catcher is skilful, in the often-traversed roads of the animals. Mole-catching has long been a distinct trade in Britain. Another species (*T. cæca*) is found in the most southern parts of Europe; very similar to the Common *M.*, but rather smaller, and having the eye always covered by the eyelid, so as to justify Aristotle's statement, that the *M.* is blind.

The N. Amer. species are Star-nosed *M.* (*Condylura*) and Shrew *M.* (*Scalops* and *Scapanus*): they are very

MOLÉ—MOLE-CRICKET.

similar to the European Common M. above described: see SHREW MOLE: STAR-NOSE.

Among other *Talpidae* are the CHANGEABLE M., or CAPE M. (*Chrysochloris Capensis*) of s. Africa, remarkable as the only one of the mammalia that exhibits the splendid metallic reflections frequent in some other classes of animals.

MOLÉ, *mo-lû'*, LOUIS MATTHIEU, Comte: French statesman: 1781, Jan. 24—1855, Nov. 23; b. Paris; descendant of the magistrate, Matthieu M. (1584–1653). His father, pres. of the parliament of Paris, died by guillotine 1794: his mother was daughter of Malesherbes. In 1805, M. published *Essais de Morale et de Politique*, in which he vindicated the govt. of Napoleon I. on the ground of necessity. The attention of the emperor was drawn to him; he was appointed to various offices in succession, and raised to the dignity of a count and to a place in the cabinet. After Napoleon's return from Elba, he refused to subscribe the declaration of the council of state banishing the Bourbons forever from France, and declined to take his seat in the chamber of peers. In 1815, Louis XVIII. made him a peer, and he voted for the death of Ney. In 1817, he was for a short time minister of marine; 1830 he became minister of foreign affairs in Louis Philippe's first cabinet, but only for a short time; 1836 he succeeded Thiers as prime minister. His ministry was very unpopular with the liberal party; and he resigned 1839. In 1840 he was chosen a member of the *Académie Française*, and thereafter took little part in politics. M. was fiercely attacked, unjustly it is now believed, as servile toward the court. He believed in strong government, but favored constitutional liberty.

MOLE-CRICKET (*Gryllotalpa*): genus of insects of the Cricket (q.v.) family (*Achetidae* or *Gryllidae*), remarkable for burrowing habits and for the great strength and



Mole-Cricket, and Eggs (*Gryllotalpa vulgaris*).

breadth of the forelegs. The other legs also are large and strong, but of the form usual in the family.—The best-known species (*G. vulgaris*)—common in many parts of Eu-

MOLECULE—MOLE-RAT.

rope, but very local—is almost two inches long; of velvety brown color; the wings, when folded, do not cover much more than one-half of the abdomen, though large when expanded. It uses its forelegs not only for digging burrows in earth, but for cutting through or tearing off the roots of plants which are found in its way. The M. feeds both on animal and vegetable substances, and often does much injury to crops. The chirping and somewhat musical call of the M., produced in the same way as that of the common cricket, is heard chiefly in the end of spring and beginning of summer, and only in the evening or at night: in parts of England, this sound has gained it the name *Chur-worm*: another local English name is *Croaker*.—The female M. prepares a curious nest, a rounded subterranean cell, about as large as a hen's egg, having a complicated system of winding passages around it and communicating with it. In this cell, she deposits 100 to 400 eggs. The young live for some time in society. They run actively, both in the larva and pupa states. The M. is very combative, and the victor generally eats the vanquished.—A species of M. (*G. didactyla*) does great injury to the plantations of sugar-canes in the W. Indies.—A curious Indian insect, of closely allied genus (*Schizodactylus monstrosus*), has prodigiously long wings, which, as well as the wing-covers, are rolled into spiral coils at the tips.

MOLECULE, n. *mōl'ĕ-kūl* [F. *molécule*, a particle of matter or air—from mid. L. *molec'ŭla*, a molecule—from L. *mōlēs*, a mass]: minute mass; one of the elementary particles into which all bodies are supposed to be resolvable; the smallest possible part of a body existing in a free state which can be broken up only into atoms of a different nature—thus, 'hydrogen' in a free state exists in pairs of atoms, each pair being called a molecule (see ATOM: ATOMIC THEORY: ATOMIC WEIGHTS: CHEMISTRY: ELEMENTS, CHEMICAL: MATTER: VORTEX). MOLECULAR, a. *mō-lĕk'ŭ-lĕr*, pertaining to or consisting of molecules. MOLECULAR'ITY, n. *-lār'ĭ-tĭ*, the state of being molecular; the state of consisting of molecules. MOLECULAR ATTRACTION, that force or power by which the particles or molecules that compose a body are kept together in one mass. MOLECULAR VOLUMES (see references under MOLECULE, above).

MOLE-RAT (*Spalax* or *Aspalax*): genus of rodent quadrupeds of family *Muridæ*, having teeth almost like those of rats, but in many respects resembling moles—e.g., in general form, shortness of limbs, concealment of ears, smallness or even rudimentary condition of eyes, and burrowing habits—though their food is altogether different, consisting wholly of vegetable substances, chiefly roots. One species (*S. typhlus*) inhabits s. Russia and parts of Asia. It is known also as the *Podolian Marmot*, *Blind Rat*, *Slepez*, *Zemni*, etc. The M. makes tunnels and throws up hillocks like the mole, but its hillocks are much larger.—Another species, in the Ma-

Iayan archipelago, is as large as a rabbit.—Nearly allied is the COAST RAT or SAND MOLE of s. Africa (*Bathyergus maritimus*), also as large as a rabbit, with other species of the same genus, also natives of s. Africa, which drive tunnels through the sandy soil, and throw up large hillocks.

MOLE'SKIN AND COR'DUROY: varieties of FUSTIAN (q.v.), which generic term includes also velveteen, velvet, thick-set, thick-set cord, beaverteen, and other stout cotton cloths for men's apparel—a class of goods largely manufactured in Lancashire, England. For the general structure of these fabrics, see FUSTIAN: VELVET. They all are in fact of the nature of velvet, with a *nap* or *pile* on the surface; and most of them are twilled.

When cloth of this kind leaves the loom, its surface is covered with loops like Brussels carpet, and these are cut open with a ripping-knife of peculiar shape, which the operatives learn to use with great dexterity. The hairy and uneven appearance which the cloth acquires in this operation is subsequently improved by the shearing process. The cloth is next steeped in hot water, for riddance of the paste used in dressing the yarn, and is then ready to be passed through the brushing or teasing machine, which consists of blocks of wood with concave surfaces covered with card-brushes, working forward and backward in a lateral direction against wooden rollers encased in tin-plate, over which the cloth passes. The tin-plate is made rough with the burs of punched holes. In the next operation, the fustian is singed by passing the nap side quickly over a red-hot metal cylinder. The brushing and singeing are repeated three and occasionally four times, to give the cloth a smooth appearance. It is then washed, bleached with chloride of lime, and dyed—usually of some shade of olive, slate, or other quiet color.

The different names given to fustian cloths depend on their degree of fineness and the manner in which they are woven and finished. Thus, smooth kinds, of strong twilled texture, are called *moleskins* when shorn before dyeing, and *beaverteens* when cropped after dyeing. Corduroy, or king's cord, is produced by a peculiar disposition of the pile-threads. In all fustians, there is a warp-and-weft thread, independent of the additional weft-thread forming the pile; but in corduroys, the pile-thread is only 'thrown in' where the corded portions are, and is absent in the narrow spaces between them.

The increased price of cotton, and the introduction of cheap woolen fabrics, have recently much curtailed the use of the various fustian cloths, though they are still largely worn by some classes of mechanics and laborers.

MOLEST—MOLESWORTH.

MOLEST, v. *mō-lĕst'* [F. *molester*—from mid. L. *moles-tārĕ*, to molest: L. *molestus*, troublesome, offensive: It. *molestare*]: to disturb, trouble, or vex; to annoy; to render uneasy. **MOLEST'ING**, imp. **MOLEST'ED**, pp. **MOLEST'ER**, n. -*ēr*, one who molests. **MOLESTATION**, n. *mōl'ēs-tā'shŭn*, annoyance; uneasiness given; disturbance: in *Scotch law*, disturbance of the possession of heritage—an action for molestation being the remedy for the trespass. **MOLESTFUL**, a. *mō-lĕst'fŭl*, troublesome.—**SYN.** of 'molest': to tease; inconvenience; incommode.

MOLESWORTH, *mōlz'worth*, Sir **WILLIAM**, Right Honorable (eighth baronet): English statesman: 1810, May 23—1855, Oct. 22; b. London; lineally descended from an old Cornish family of large possessions (the first baronet was pres. of the council in Jamaica in the time of Charles II., and subsequently gov. of that island). His university career at Cambridge was cut short by his sending (under great provocation) a challenge to his tutor to fight a duel. He continued his education at the Univ. of Edinburgh, and subsequently at a German university. After making the usual tour of Europe, he returned home, and threw himself 1831 into the movement for parliamentary reform. Next year, though only just of age, he was elected member of parliament for Cornwall (East). He sat for Leeds 1837–41, and then remained out of parliament four years. He was the intimate friend of Bentham and James Mill, and was regarded as the parliamentary representative of the 'philosophical radicals.' In 1839, he commenced and carried to completion, at a cost of not less than £6,000, a reprint of the entire miscellaneous and voluminous writings of Hobbes, the 'Philosopher of Malmesbury.' The publication did him great disservice in public life, his opponents ascribing to him the freethinking opinions of Hobbes in religion, as well as the philosopher's conclusions in favor of despotic government. In 1845, he was elected for Southwark (which he continued to represent until his death), and entered on a parliamentary career of great energy and usefulness. He was the first to call attention to abuses in the transportation of criminals; and as chairman of a parliamentary committee he brought to light all the horrors of the convict system. He pointed out the maladministration of the colonial office, explained the true principles of colonial self-government, prepared draught constitutions for remote dependencies, and investigated the true and natural relations between the imperial government and its colonial empire. 1853, Jan., he accepted the office of first commissioner of public works, in the administration of the Earl of Aberdeen; and 1855 the post of sec. of state for the colonies, in that of Viscount Palmerston; but died before he could give proof of his administrative capacity in the latter office. He established the *London Review*, a new quarterly, 1835; and afterward purchased the *Westminster Review*, organ of the 'philosophical radicals.' The two quarterlies were then merged into one, under the title *London and Westminster*.

MOLE-TRACK: see under MOLE 3.

MOLFETTA, *mōl-fèt'tâ*: city of s. Italy, province of Bari, on the Adriatic, 18 m. n.w. of Bari. The neighborhood yields excellent fruits, especially almonds and oranges, and has extensive olive plantations. Fish abound along the coast. The city contains a magnificent cathedral, and is partly inclosed by walls; it is conjectured that it occupies the site of some early forgotten town, from the numerous vases, urns, and other relics of antiquity found in its vicinity. Pop. (1881) 29,697.

MOLIÈRE, *mo-le-ür'*, JEAN BAPTISTE (properly *Jean Baptiste Poquelin*—the name Molière not having been assumed till he had commenced authorship): one of the greatest—probably the greatest—of all writers of social comedy: 1622, Jan.—1673, Feb. 17; b. Paris; son of Jean Poquelin, upholsterer, who subsequently became a valet-upholsterer to the king. Regarding the boyhood of M., almost nothing is known, but his credulous biographers have put together whatever traditionary gossip they could find floating on the breath of society. Voltaire, while recording these *contes populaires*, as he calls them, pronounces them *très-faux*. All that we really are certain of is, that in his 14th year he was sent to the Jesuit *Collège de Clermont* in Paris, where he had for a fellow-student Prince Armand de Conti, and that, on leaving the collège, he attended for some time the lectures of Gassendi. He was charmed, we are told, by the freedom of thought permitted in speculative science, and, in particular, conceived a great admiration for Lucretius, the Roman poet-philosopher, whom he undertook to translate. Of this translation, only a single passage remains, intercalated in the *Misanthrope* (act ii. scene 4). About 1641, he commenced the study of law, and appears to have even passed as an advocate; but the statement of Tallemant des Réaux, that he actually ventured into the precincts of theology, is generally rejected. M. detested priests. So gay, humorous, and sharp-eyed a humanitarian would have felt quite miserable under the restraints of a monkish life. In 1645, he suddenly appeared on the stage as member of a company of strolling players, which took the name *Illustre Théâtre*, and performed at first in the faubourgs of Paris, and afterward in the provinces. For the next 12 years, we can catch only an occasional glimpse of him. He was playing at Nantes and Bordeaux 1648, at Narbonne and Toulouse 1649, at Lyon 1653 (where his first piece, *L'Étourdi*, comedy of intrigue, was brought out), at Lyon and Narbonne again 1655, at Grenoble during the carnival, also at Rouen 1658. During these now obscure peregrinations, he seems, though an industrious actor, to have been also a diligent student. He read Plautus, Terence, Rabelais, and the Italian and Spanish comedies, besides—without which, indeed, all the rest would have been of little avail—making a constant use of as quick eyes as ever glittered in a Frenchman's head. At Paris, by the powerful recom-

mendation of his old school-fellow, the Prince de Conti, M.'s company got permission to act before the king, who was so highly pleased, that he allowed them to establish themselves in the city under the title of the *Troupe de Monsieur*, conveying the idea of a sort of royal patronage. In 1659, M. brought out *Les Précieuses Ridicules*, the fine satire of which—lapsing at times, however, into caricature—was instantly perceived and relished. ‘*Courage, Molière!*’ cried an old man on its first representation; ‘*voilà la véritable comédie.*’ The old man was a prophet. Veritable comedy dated in France from that night. Ménage, the critic, is reported to have said to Chapelain, the poet, as they were going out of the theatre: ‘Henceforth (as St. Remi said to Clovis), we must burn what we have worshipped, and worship what we have burned.’ In 1660 appeared *Sganarelle, ou le Cocu Imaginaire*; and in 1661, *L’Ecole des Maris*—founded partly on the *Adelphi* of Terence, in which M. completely passes out of the region of farce into that of pure comic satire—and *Les Fâcheux*. In the following year, M. married Armande-Grésinde Béjard, either sister or daughter (for it is still undetermined) of Madeleine Béjard, who was an actress of his troupe, with whom he had formerly lived in what the French politely call ‘intimate relations.’ There is, however, no ground for the revolting calumny freely circulated even in M.’s lifetime regarding his marriage. His literary activity continued as brisk as before. Among several pieces belonging to this year, the most celebrated is *L’Ecole des Femmes*, which excited, not without reason, violent indignation among the clergy and the devout, for there was an excessive indecency in the expression, and the author indulged in a caricature of religious mysteries that could not but be offensive. M. defended himself with incredible audacity in his *Impromptu de Versailles*. *Le Tartufe*, written 1664, was prohibited from being brought on the stage; but M. was invited by his literary friends, Boileau and others, to read it in a semi-public manner, which he did with the greatest approbation. In 1665, Louis XIV. bestowed a pension of 7,000 livres on M.’s company, which now called itself *Troupe du Roi*. Next year appeared *Le Misanthrope*, most artistic of all his comedies; soon followed by *Le Médecin Malgré Lui*. When *Tartufe* was at last brought on the stage, 1669, it obtained a superb success. The truth, the variety, the contrast of the characters, the exquisite art in the management of the incidents, the abundance of the sentiments, and the wonderful alternations of feeling—laughter, anger, indignation, tenderness, make this, in the opinion of most critics, M.’s masterpiece. To the same year belongs *L’Avaro*. In 1670 appeared *Le Bourgeois Gentilhomme*, a pleasant satire on a prevalent vice among wealthy tradesmen in the France of that day—the vulgar ambition to pass for fine gentlemen. Then came *Les Fourberies de Scapin* (1671), followed by *Les Femmes Savantes* (1672), full of admirable passages; and *Le Malade Imaginaire* (1673), the most popular, if not the

best of all M.'s comedies. While acting in this piece, he was seized with severe pains, which, however, he managed to conceal from the audience; but on being carried home hemorrhage ensued, and he expired at ten o'clock at night. As M. had died in a state of excommunication, and without having received the last aids of religion—which, however, he had implored—the abp. of Paris refused to let him be buried in consecrated ground; but the king interfered—a compromise was effected, and he was privately interred in the cemetery of St. Joseph, being followed to the tomb, as a letter said to be by an eye-witness declares, by 'no procession, except three ecclesiastics, four priests who bore the body, . . . six children in blue, who carried candles in silver holders, and . . . lackeys with burning torches of wax. . . . There was a great crowd.' The place where the body lies is unknown. In 1792 M.'s supposed remains were transferred to the Museum of French Monuments, whence they were removed to Père-la-Chaise 1817; but the tomb that was opened appears not to have been that of M. In his private character M. was gentle, generous, and agreeable.—Among the best editions of M.'s works are those of Auger (1819-25), Aimé-Martin (1833-36), Moland (1871), and Despois (1874 *et seq.*). A complete English translation of M.'s works is that by Van Laun, 6 vols. (Edin. 1875-6). The best biographies are by Taschereau (1825-27) and Bazin (1851). See the excellent *Bibliographie Molièresque* of Paul Lacroix (1875).

MOLINA, *mo-lē'nâ*, Luis: Spanish Jesuit theologian: 1535-1600, Oct. 12; b. Cuença, in New Castile. He entered the Jesuit Society in his 18th year, studied at Coimbra, and was appointed prof. of moral theology at Evora, where he taught for 20 years. He died at Madrid. M.'s celebrity is mainly confined to the theological schools. His principal writings are a commentary on the *Summa* of St. Thomas (Cuença, 2 vols. 1593); a minute and comprehensive treatise *On Justice and Right* (Cuença, 3 vols. 1592; reprinted Mainz 1659); and the celebrated treatise, *The Reconciliation of Grace and Free-will*, Lisbon 1588, with appendix 1589. To the last-named work mainly M.'s celebrity is due.—See MOLINISM.

MOLINE, *mō-lē'n'*: city, Rock Island co., Ill.; on the e. bank of the Mississippi river; an important railroad centre, and a thriving business locality. Between the city and the island of Rock Island is a narrow channel through which a portion of the river passes with great velocity, supplying a magnificent water-power. M. has eight churches, a high school, a free library, a bank, and four newspapers. Its manufacturing interests are varied and extensive, including shops in which plows and other agricultural implements are made on a large scale, pipe-organ factory, flour-mills, paper-mill, scale factory, and furniture shops. Steam-engines, wagons, pails, and lead roofing are manufactured. The city is lighted with gas and has a system of water-works. Pop. (1870) 4,166; (1880) 7,800; (1890) 12,000; (1900) 17,248.

MOLINELLA, *mô-lē-ně'l-lâ*: town of Italy, province of Bologna, about 30 m. n.e. of the city of Bologna. The first houses were on islands in the Po, but with the gradual change of the river to its present bed, and the union of the islands, M. has grown in importance. It carries on hemp manufacture, and is a centre of the cheese trade. The buildings are substantial, and the river-side, which was the original location of the town, is now several m. distant. Pop. about 11,000.

MOLINISM, n. *mô'lin-izm*: in Rom. Cath. doctrine, system taught by Luis Molina (q.v.), Spanish Jesuit, concerning Divine grace and predestination. **MOLINIST**, follower of the system taught by Molina.—*Molinism* deals with a problem almost as old as the origin of human thought. It had already led, in the 4th c., to the well-known PELAGIAN CONTROVERSY (see PELAGINS). In reconciling with the freedom of man's will God's predestination of the elect to happiness, and of the reprobate to punishment, M. asserts that the predestination is consequent on God's foreknowledge of the free determination of man's will; therefore, that it in no way affects the freedom of the particular actions, in requital of which man is predestined whether to punishment or to reward. God, in M.'s view, gives to all men sufficient grace whereby to live virtuously and merit happiness. Certain individuals freely co-operate with this grace; certain others resist it. God foresees each course, and this foreknowledge is the foundation of one or of the other decree. This exposition, which somewhat resembles that of Arminianism (see ARMINIUS, JACOBUS) in Protestantism, was probably in accord with the prevalent feeling in the Rom. Cath. Church at that time, and was commended by its antagonism to the teachings of some prominent Prot. reformers. But it was at once assailed in the schools on two grounds—first, as a revival of the Pelagian heresy, inasmuch as it appears to place the efficacy of grace in the consent of man's will, and thus to recognize a natural power in man to elicit supernatural acts; second, as setting aside altogether what the Scriptures represent as the special election of the predestined, by making each individual, according as he freely accepts or refuses the grace offered to all in common, the arbiter of his own predestination or reprobation. Hence arose the famous dispute between the MOLINISTS and the THOMISTS. It was first brought under the cognizance of the inquisitor-gen. of Spain, by whom it was referred to Pope Clement VIII. This pontiff, 1598, appointed the celebrated congregation, *De Auxiliis*, to consider the entire question; but notwithstanding many long discussions, no decision was arrived at during the life-time of Clement; and though the congregation was continued under Paul V., the only result was a decree, 1607, permitting both opinions to be taught by their respective advocates, and prohibiting each party from accusing its adversaries of heresy. Also attempts were made to bring under control the publication of commentaries on Thomas Aquinas.

The dispute, in some of its leading features, was revived in the Jansenist controversy (see JANSEN, CORNELIUS); but with this striking difference, that whereas the rigorous Jansenists denied the freedom of the will when acted on by efficacious grace, all the disputants in the scholastic controversy—even the Thomists—maintain that, in all circumstances, the will remains free, though they may fail to explain how this freedom is secured under the action of efficacious grace. See AQUINAS.—M. has been commonly taught in the Jesuit schools; but a modification of it was introduced by the celebrated Spanish divine, Suarez (q.v.), in order to save the doctrine of *special election*. Suarez held, that though God gives to all men grace absolutely sufficient for their salvation, yet he gives to the elect a grace which is not alone in itself sufficient, but which is so attuned to their disposition, their opportunities, and other circumstances, that they infallibly, though yet quite freely, yield to its influence. This modification of Molina's system is called CONGRUISM. M. must not be confounded either with Pelagianism or semi-Pelagianism, inasmuch as M. distinctly supposes the inability of man to do any supernatural act without God's GRACE (q.v.).

MOLINO DEL REY, *mō-lē'nō dēl rā*, BATTLE OF: brilliant engagement in the Mexican war. The massive structures from which the battle received its name were of stone and had been used successively as flour-mills and foundries, when Santa Anna employed them as a fortress from which to defend the castle of Chapultepec, half-a-mile distant and six m. from the city of Mexico. The U. S. forces, about 10,000 men, had won the battles of Contreras and Churubusco, and were near the castle of Chapultepec, when an armistice was arranged and a commissioner of the U. S. govt. endeavored to effect a settlement of the difficulties with the Mexican authorities. His efforts proving ineffectual, hostilities were resumed; and 1847, Sep. 8, the Americans attacked M., which, after a desperate resistance by a force superior in numbers, surrendered the same day. This battle had an important bearing on the future of the war, as it opened the way to the speedy capture of Chapultepec and to the occupation of the city of Mexico by U. S. troops.

MOLINOS, *mo-lē'nōs*, MIGUEL DE: Spanish Rom. Cath. priest, advocate of a phase of Quietism (see QUIETISTS): 1627, Dec. 21—abt. 1696; b. Patacina, Aragon; of noble parentage. He received holy orders and was educated at Pampeluna, and afterward at Coimbra, at which univ. he obtained his theological degree. After gaining distinction in his native country, M. went to Rome, where he soon acquired high reputation as a director of conscience and a master of the spiritual life. His private character was in keeping with this reputation. He steadily declined all ecclesiastical preferment, and confined himself entirely to his duties in the confessional and in

MOLINOS.

the direction of souls. An ascetical treatise which he published, *The Spiritual Guide*, added largely to the popularity which he had acquired in his personal relations; but there were not wanting many who, in the visionary principles of this work, discerned what they deemed the seeds of a seductive error. Among these, the celebrated preacher, F. Segneri, was the first who ventured publicly to call them into question; but his strictures were by the friends of M. ascribed to jealousy of the influence which M. had acquired with the people. By degrees, however, reports unfavorable to the practical results of this teaching, and even to the personal conduct and character of M., or of his followers, began to find circulation; and eventually, 1685, he was cited before the Holy Office, and submitted to close imprisonment and examination. In addition to the opinions contained in his book, a prodigious mass of papers and letters, to the number, it is said, of 20,000, found in his house, were produced against him, and he was himself rigorously examined as to his opinions. The result of the trial was a solemn condemnation of 68 propositions, partly extracted from his *Spiritual Guide*, partly, it appears, drawn from his papers or his personal professions. These doctrines M. was required publicly to abjure, and he was sentenced to close imprisonment, in which he is believed to have been detained until his death. The opinions imputed to M. may be described as an exaggeration of the most visionary and enthusiastic principles of QUIETISM (see QUIETISTS). According to the propositions condemned by the Inquisition, M. pushed to such an extreme the contemplative repose which is the common characteristic of Quietism, as to teach the utter indifference of the soul, in a state of perfect contemplation, to all external things, and its entire independence of the outer world, even of the actions of the very body which it animates; whence it was logically inferred that he taught that this internal perfection is even compatible with the worst external excesses. These consequences are not openly avowed in *The Spiritual Guide*, but they appear deducible in some sort from some of its maxims, and the accusation was that they were plainly contained in the papers of M., produced at his trial. The report was that they were even admitted by himself. It is to be considered, however, that visionary or dangerous as his extreme views may have been, they would at least have been sufficiently commended to the detestation of his Jesuit opposers by their emphasis on the inward rather than on the outward; by M.'s disregard of external mortifications; and by his advice to monks and nuns to lay aside images and relics of saints, in order to worship God in spirit and in the quietness of the inmost soul. After the death of M., no further trace of his teaching appears in Italy, but it was revived in more than one form in France,—See John Bigelow's *Molinos, the Quietist* (N. Y. 1882).

MOLISE—MÖLLER.

MOLISE, *mo-lē'sā*: former province of Italy: see **CAMPASSO**.

MOLLAH, n. *möl'lă* [Ar. *maula*; Turk. *molla*—from *walai*, to rule]: among the Turks, title of a superior order of judges. The Mollahs are divided into two classes: the first class—four in number, from whom the Mollahs at the court of the Padishah are elected—possesses jurisdiction over the more important pashaliks (Adrianople, Brusa, Damascus, Cairo); and the second—holding their office for only a lunar month at a time, and the lowest rank of whom is formed by the naibs—over the inferior provinces, towns, and villages. The M. is an expounder of civil and criminal law, and of the religion of the state; he is therefore necessarily both lawyer and ecclesiastic. Under him is the Cadi or judge, who administers the law, and superior to him are the Kadhiasker and the Mufti (q.v.). They all are subject to the Sheikh Al Islam or supreme Mufti. In Persia, the office of M. is similar to what it is in Turkey; but his superior is there the 'Sadr,' or chief of the Mollahs. In the states of Turkestan, the Mollahs have the whole government in their hands.

MOLLASSE': see **MOLASSE**.

MOLLE, n. *möl'lě* [L. neut. sing. of *mollis*, soft]: in *mus.*, term applied in mediæval music to B flat as opposed to B natural, which was called B durum. Hence, the term came to signify major and minor mode, as in the German, e.g., A dur, the key of A major; A moll, the key of A minor. Hence, too, the French formed the word *bémol*, a flat.

MOLLIENT, a. *möl'li-ěnt* [L. *molliens* or *mollien'tem*, softening—from *mollis*, soft]: serving to soften; assuaging. **MOL'LIENTLY**, ad. *-lě*. See **EMOLLIENT**, under **EMOLLiate**.

MÖLLER, *möl'lér*, **HENRY**: 1749–1829, Sep. 16; b. Hamburg: Lutheran clergyman. He emigrated to the United States 1763; was taken into the family of the Rev. Henry M. Muhlenberg, D.D., in Philadelphia; became a teacher in the latter's school; applied his leisure to studying theol.; and was licensed to preach by the Evang. Lutheran synod of Pennsylvania. Prior to the revolutionary war, he passed his time among the poor, expounding the principles of his faith and gathering the people into congregations; and through the war he served as chaplain of a German regt. in the American army. Subsequently he held pastorates in Reading, Philadelphia, and Albany, and erected the first Lutheran church in the latter city. He preached at New Holland, Penn., 1788–95, Harrisburg 1795–1803, Albany 1803–09, and afterward was in charge of the Lutheran churches at Sharon and New Rhinebeck, N. Y.

MOLLIFY—MOLLITIES.

MOLLIFY, v. *mōl'li-fī* [F. *mollifier*--from mid. L. *mollificārē*: It. *mollificare*, to render soft or supple, to mollify--from L. *mollis*, soft; *fīō*, I become]: to calm; to pacify; to soften; to mitigate. **MOL'LIFYING**, imp.: **ADJ.** softening; mitigating. **MOL'LIFIED**, pp. *fīd*. **MOL'LIFIER**, n. *-fī-ēr*, one who or that which softens or appeases. **MOL'LIFI'ABLE**, a. *-ō ol*, that may be softened; capable of being mollified. **MOL'LIFICA'TION**, n. *-fī-kā'-shūn*, the act of mollifying; the state of being mollified. —**SYN.** of 'mollify': to assuage; appease; quiet; qualify.

MOLLITIES, n. *mō-līsh'ī-ēz* [L. *mollitiēs*, softness]: in *med.*, a diseased softening of an organ, or part of an organ. **MOLLITIES OSSEUM**, or **OSTEOMALAKIA**, an obscure disease of the nutritive cells of the bones, which renders them soft, fragile, and unable to sustain the weight of the muscles. In the progress of the disease, the various earthy substances which give strength to healthy bones are diverted from their proper use and to a great extent are eliminated from the system through the action of the kidneys. The diseased bones consist largely of gelatine and are easily bent; their extremities become enlarged, and fractures which do not readily heal frequently occur. After death the bones are soft, light, and brittle, and of a color between red and brown, but when thoroughly dried they become transparent. Frequently cavities are found. These are filled in some cases with an oily fluid, in others they contain clear serum. Some investigators regard this as the result of the conversion of the bony substance into medullary matter; others look upon it as a malignant formation. In the majority of cases all the bones are affected, but those of the head sometimes escape. In its first appearance the disease resembles rheumatism, but it can soon be distinguished by the excessive quantity of phosphatic matter in the urine. It is very painful and the patient becomes unable to either stand or sit erect. It seldom attacks a person under 20 years of age, and a large proportion of its subjects are females. Owing to the diseased condition of the organs of nutrition and assimilation, the natural method of supplying the system with the phosphates and other substances which are deficient in the bones is of no avail. Tonics in the first stages, and stimulants, with opiates to produce sleep, in later stages, are the ordinary remedies, but the disease—fortunately rare—usually advances to a fatal termination.

MOLLUSCA.

MOLLUSCA: one of the great animal sub-kingdoms, including so wide a range of distinct forms, that it is difficult to frame a definition applicable to all. The lowest forms, termed Polyzoa (q.v.) or Bryozoa, present so strong a resemblance to zoophytes, that until recently they were associated with the latter; while, on the other hand, in some of the most highly organized of this sub-kingdom, the Cephalopoda, there is considerable analogy to the vertebrated series, as is shown by the presence of a rudimentary cartilaginous brain-case, and by the remarkably high development of the nervous system. The bilateral symmetry of external form almost universal in articulated and vertebrated animals, is here frequently modified; and taking them as a whole, the M. are characterized by the absence rather than by the presence of any definite form. The bodies of these animals are always of soft consistence—a property to which they owe their name, which was devised for them by Cuvier, before whose time they were included in the *Vermes* of Linnæus's arrangement. The *shell*, when it exists, is not to be regarded as an exo-skeleton giving attachment to muscles, and regulating the form of the animal, but merely as an appendage designed for the protection of the body from which it derives its shape; indeed, it is only where the body is uncovered by a shell, or where the locomotive organs can be projected beyond it, that any active movements can be effected. The whole fabric is inclosed in a thick, soft, flexible skin, called the *mantle*, and it is on the surface of this envelope that the shell is formed by the development and subsequent calcification of epithelial cells. In many of the M., the shell is composed of a single piece, usually a spiral tube closed at one end, and gradually increasing in size toward the open extremity from which the animal is able to protrude itself. Shells of this description are called *univalves*. In others, the shell is composed of two pieces or valves, attached to each other at one point by a hinge furnished with an elastic ligament that serves to open the valves, when it is not opposed by the action of the *adductor* muscles, whose office it is to keep the shell closed. Shells of this kind are termed *bivalves*. These differences in the character of the shell correspond with differences in the conformation of the animals inhabiting them. The bivalve M. exhibit no traces of a head, and hence are termed *Acephalous* M.; while the univalves have a distinct head, provided with organs of the special senses; hence, by way of distinction, some writers have termed them *Cephalophora* (or head-bearing). Many M. are altogether unprovided with a shell, or have only a small calcareous plate embedded within the mantle. These are termed *naked* M. It is worthy of notice that the young mollusk, while still in the egg, is almost always furnished with a delicate pellucid shell, even when it is ultimately to be naked, in which case the embryonic shell is cast off soon after the animal makes its escape from the egg. For the mode of formation, etc., of the shell, see SHELL.

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The movements of many of the M. are executed by means of a muscular structure developed in the middle of the ventral surface of the body, and termed the *foot*. In some (the Gasteropoda), the foot forms a sort of flattened disk, by the alternate contraction and expansion of different parts of which the animal can slowly crawl forward; while in others (the free-moving bivalves) it is a tongue-like organ, which can be protruded between the valves, and by its sudden extension, after being previously bent upon itself, can enable its possessor (the common cockle, e.g.) to take considerable leaps. The foot is also the agent by means of which certain species burrow in the sand or mud, and others bore into the solid rock. Many M., however, are firmly attached to a single spot, except during their larval state; and as they do not require a foot, we find it either altogether undeveloped (as in the oyster), or serving to support a glandular organ, from which filaments of silky or horny matter (called the *byssus*) are secreted, which serve to attach the animal (the common mussel, e.g.) to rocks, stones, etc., beneath the water. Many of the subdivisions of the M. present modes of locomotion altogether independent of a foot, e.g., the *Biphora* (see TUNICATA); those bivalves which possess a branchial or respiratory chamber, into which water is drawn, and again expelled by muscular action, a recoil being thus produced which serves to drive the animal through the water; the *Pteropoda* (q.v.), furnished with a pair of broad flattened fins (which are possibly processes of a modified foot) at the sides of the head, by means of which they swim with moderate rapidity; and the *Cephalopoda*, in which the mouth is surrounded by a number of arms, which serve not only as organs of motion, but for capture of prey.

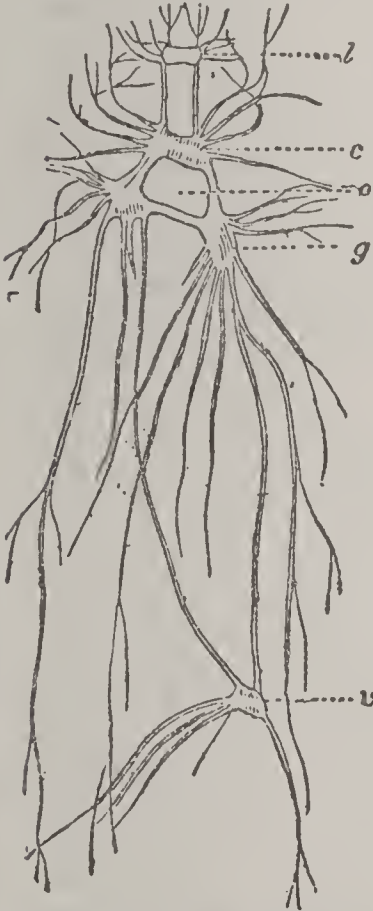


Fig. 1.—Nervous System of the *Aplysia*, a Gasteropodous Mollusk:

c, cerebral ganglia; *g*, thoracic or sub-esophageal ganglia; *o*, nervous collar surrounding the esophagus; *l*, labial ganglia; *v*, visceral ganglion.

The *nervous system* in the M. is developed in accordance with two distinct types. In the lowest group of this sub-kingdom (the Molluscoids), there is only a single ganglion with afferent and efferent fibres radiating in every direction; while in the higher groups there are several ganglia lying somewhat irregularly in different parts of the body, and communicating by nervous threads with a larger mass in the

head, or in the neighborhood of the esophagus. This

mass consists of several ganglia, which from their position are termed *supracosophageal*, and is united by filaments with other ganglia lying below the esophagus, so as to form a ring or collar around that organ. The supra-esophageal ganglia furnish the nerves to the special organs of the senses. Most of the M. possess special *organs of touch* in the form of lips or of special lobes around the mouth; of tentacles or arms upon the head, or of cirrhi upon other parts of the body; and in addition to these special organs, the skin appears to possess considerable sensibility. When tentacles are present, they are either two or four in number; and they can be protruded and retracted at pleasure, as every one must have noticed in the case of these organs (popularly known as *horns*) in the snail. *Organs of sight* are not universally present. In many M., there is only a single rudimentary eye, while in others there is a large number of imperfect eyes (termed *ocelli*), which do not of necessity lie in the region of the head. In the higher M., there are two eyes, sometimes placed directly on the head, sometimes on the tentacles; and in the highest group (the Cephalopods), the eyes are as fully developed as in fishes.

Organs of hearing, in a simple form, are almost always present. They consist usually of round vesicles in the neighborhood of the esophageal ring, from which they receive a nervous filament. They contain a clear fluid and a small concretion of carbonate of lime, which is sometimes roundish, and sometimes of crystalline form, and is in a perpetual state of vibration, in consequence of ciliary action in the interior of the vesicle. Whether there are any special *organs of smell and taste* in the M., is unknown.



Fig. 2—Anatomy of the Snail:

a, the mouth; *bb*, foot; *c*, anus; *dd*, lung; *e*, stomach, covered above by the salivary glands; *ff*, intestine; *g*, liver, *h*, heart; *i*, aorta; *j*, gastric artery; *l*, hepatic artery; *k*, artery of the foot; *mm*, abdominal cavity, supplying the place of a venous sinus; *nn*, irregular canal in communication with the abdominal cavity, and carrying the blood to the lung; *oo*, vessel carrying the blood from the lung to the heart.

The organs of *vegetative* life (of digestion, circulation, etc.) are much more fully developed in the M. than those of *animal* life. The alimentary canal, which presents

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almost every variety of form from a simple cavity to a complicated intestine, is always provided with two distinct openings, a mouth and an anus, the latter often (as in the Gasteropoda and Pteropoda) on the right side of the anterior part of the body. The liver is always present, existing in a mere rudimentary form in the Polyzoa, constituting a large part of the body in the acephalous bivalve M. (as the mussel and cockle), and a still larger part in the Gasteropoda (as the snail), while in the Cephalopoda it is constructed on nearly the same plan as in fishes. Other secreting organs, such as salivary glands, pancreas, and urinary organs, also are present in the more highly developed mollusca.

The circulation of the blood is effected (except in the Polyzoa) by means of a distinct heart, which usually

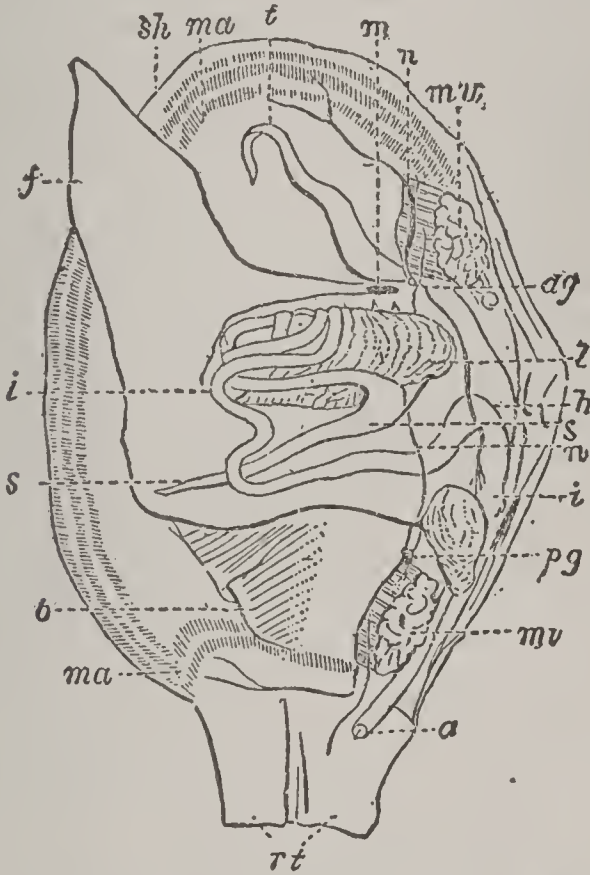


Fig. 3—Anatomy of an Acephalous Mollusk (*Mactra*):

m, mouth; *s*, stomach; *ii*, intestine; *ag*, anterior ganglions; *pg*, posterior ganglions; *mu*, muscles; *a*, anus; *h*, heart; *l*, liver; *f*, foot; *sh*, shell; *ma*, mantle; *b*, branchiæ; *t*, tentacula; *r*, oral, or respiratory siphon; *t*, anal siphon.

communicates with a regular, closed vascular system; but in some cases the venous system is imperfect, and the blood which has been transmitted by the arteries to the system in general is not confined within distinct vessels, but meanders through sinuses or passages excavated in the tissues, and through them it reaches the respiratory apparatus, whence it is transmitted by closed vessels (veins) to the heart. The blood is nearly colorless (sometimes of light blue or green tint), and contains but few floating corpuscles. In all but the very lowest M., there is a distinct respiratory apparatus,

which, excepting in the case of the terrestrial Gasteropoda (e.g., the snail), is constructed with a view to aquatic respiration, and is composed of *branchiæ*, or gills. These branchiæ usually consist of a series of membranous plates (arranged like the leaves of a book or the teeth of a comb), over which the water flows. They are sometimes attached to the surface of the body, but are usually inclosed within the mantle, or placed in a cavity in its interior called the branchial or respiratory chamber. In many of the bivalves, the openings for ingress and egress of water are prolonged into tubes or siphons, sometimes of considerable length; the tube through which the water enters being termed the *oral* siphon, while that through which it escapes is termed the *anal* siphon (see fig. 3). In all the aquatic M. except the Cephalopoda, the renewal of the water in contact with the surface of the gills is due mainly to ciliary action. In the air-breathing gasteropodous M. (of which the snails and slugs are well-known examples), there is a pulmonary sac or bag, into which the air penetrates by an opening on the right side of the body near the neck.

There are considerable differences in the modes of *propagation* of the mollusca. In the Molluscoids—the Polyzoa and Tunicata—there is both propagation by gemmation (like that of Zoophytes, q.v.) and sexual reproduction, the sexes being distinct in the Polyzoa, and united in the same individual (constituting Hermaphroditism, q.v.) in the Tunicata. In the Lamelli-branchiata, or bivalve M., and in the Cephalopoda, the sexes are separate; while in the Gasteropod the sexes are usually separate, though a considerable number are hermaphrodites, which, however, require mutual impregnation to fertilize the ova. The eggs vary greatly in form; in some cases, they are laid separately, but usually they are agglutinated together in a mass; while in some marine species many eggs are inclosed in a leathery capsule, while numerous capsules are united to form a large mass. Comparatively few M. produce living offspring, the ova being retained in the oviduct until the extrusion of the young animals.

The M. are widely diffused through time and space. They were among the earliest animal inhabitants of the globe, and are everywhere found in fresh and salt water (except at great depths), and in every latitude of the earth. The great majority are marine animals, and it is in the tropical regions that the largest and most beautiful forms are developed. It is impossible to form even an approximate estimate of the number of M. According to Leunis (*Synopsis der drei Naturreiche; erster Theil*, 1860, p. 77), there are 16,732 living, and 4,590 fossil species, exclusive of Polyzoa; and it is probable that only a small proportion of the naked or shell-less M. is yet known.

The uses of many species of M. for food are well known; and as bait for fishing, mussels and some other M. are of great value.

The animals of this sub-kingdom are divisible into

MOLLUSCA.

the *Molluscoids* and the true *Mollusca*, the former being distinguished from the latter by the very low development of the nervous system, which is composed of only a single ganglion, giving off nerves in different directions; and by their propagating by gemmation. The Molluscoids are divisible into: Class 1. POLYZOA or BRYOZOA; examples—*Plumatella*, *Flustra*. Class 2. TUNICATA; examples—*Ascidia*, *Salpa*. The true Mollusca are divisible into: Class 3. BRACHIOPODA or PALLIOBRANCHIATA; example—*Terebratulula*. Class 4. LAMELLIBRANCHIATA; examples—*Oyster*, *Mussel*, *Cockle*. Class 5. GASTEROPODA; examples—*Snail*, *Cowry*, *Limpet*, *Doris*. Class 6. PTEROPODA; examples—*Clio*, *Hyalea*. Class 7. CEPHALOPODA; examples—*Cuttle-fish*, *Nautilus*. Recent classifications transfer both Polyzoa and Brachiopoda to *Vermes*, and constitute Tunicata a separate sub-kingdom. (See ZOOLOGY: also the separate titles of the various classes.)

The literature of this subject is very extensive, and includes Cuvier, *Mémoires pour servir à l'Histoire et à l'Anatomie des Mollusques* (Paris 1817, 4to); Lamarck, *Hist. Nat. des Animaux sans Vertèbres*, 2d ed., by Deshayes and Milne-Edwards (11 vols. 8vo); Woodward, *Manual of the Mollusca*; and the third vol. (by Keferstein) of Bronn's great work, *Classen und Ordnungen des Thierreichs*; Huxley, *Morphology of Cephalous M.*; works by Owen, Lacaze-Duthiers, Kowalewsky, Kölliker; Hanley, *Molluscous Animals and their Shells* (4 vols. 8vo); Gosse, *A Manual of Marine Zoology for the British Isles*; and Alder and Hancock, *Nudibranchiate Mollusca* (published by the Ray Society).

Fossil Mollusca.—The hard shells of most M. fit them for long preservation, and make them the most frequent organic remains in the fossiliferous rocks from the Silurian upward. The tunicata and the nudibranchiate gasteropods, having no hard parts that could be preserved, are without fossil representatives; the glassy and translucent fragile shell of the pteropoda is the only known fossil from a few species in the Tertiary strata; unless, indeed, the comparatively large forms (*Conularia* and *Theca*) from the older rocks have been rightly referred to this order. The remaining four orders—Cephalopoda, Gasteropoda, Brachiopoda, and Lamellibranchiata—have existed together from the earliest period. The tetrabranchiate Cephalopoda were developed in great profusion and variety in the Paleozoic and Secondary periods; and as they decreased, the dibranchiate group took their place, and continued to increase in numbers until it reached its greatest development in the seas of our own day. Of the chambered shells like the pearly nautilus, it is estimated that over 1,400 species are known, of which only five or six exist in the ocean now; the cuttle-fishes and squids, on the other hand, are represented in the Secondary and Tertiary rocks by about 100 species, while at least twice as many are known as living species.

MOLLUSCOIDA.

The living Gasteropoda exceed the fossil in the proportion of 4 to 3. This disproportion will appear greater when we remember that the fauna of the present seas is set against the faunas of some 30 different periods, yet it must not be forgotten that we can never be acquainted with more than a fraction of the entire animal life of any bygone age. Almost contemporaneous with the first living organisms, this group has gone on increasing to the present time, when the numbers are so great that more than 8,000 living species have been recorded. A genus of air-breathing univalves has been described by Lyell, from the coal-measures of Nova Scotia. A single species—a modern-looking *Physa*—has been obtained from the Purbeck limestone, newest of the Secondary rocks. They are more frequent in Tertiary beds.

The Brachiopoda, or Lamp-shells, like the nautilus group, have their history written chiefly in the rocky tablets of the earth. Of 1,300 known species, only 75 are living, and these are comparatively rare, or are at least in almost inaccessible localities, whereas, in some periods of the earth's history, as when the chalk and mountain limestone beds were being formed, and especially during the Devonian period, the individuals abounded to an enormous extent. The genus *Lingula*, seven species of which live in modern seas, can be traced through the intervening strata, down to the first fossiliferous bed, to which, indeed, it gives the name of 'Lingula Bed;' but this species, though externally not to be distinguished from the existing shell, has a pedicle groove in the ventral valve—a character sufficient, perhaps, for the establishment of a different genus. Indeed, none of the genera of the Paleozoic rocks still exist; the want of exact information is the only excuse for the continued application of the names of recent genera to the ancient inhabitants of the globe.

The Conchifera have been gradually increasing in numbers and importance from the earliest period, and they attain their maximum development in the existing seas. The more simple forms, with an open mantle, are common in the Paleozoic strata; the siphonated families, unknown in the older rocks, appear in considerable number in the Secondary strata, and continue to increase upward. The recent species number about 3,000, while the fossil are nearly twice as many.

MOLLUSCOIDA, n. plu. *möl'lūs-koy'dă* [Eng. *mollusca*, and Gr. *eidos*, appearance]: one of the two great divisions of the sub-kingdom *Mollusca*, often compound, lower in structure than the true mollusks, and which may have shelly or horny coverings; the *Molluscoida* comprise the three classes, *Polyzoa*, *Tunicata*, and *Crachiopoda*: see MOLLUSCA: INVERTEBRATE (INVERTEBRATA).

MOLLUSK—MOLLY MAGUIRES.

MOLLUSK, or **MOLLUSC**, n. *mōl'lŭsk*, **MOL'LUSKS**, n. plu. *-lŭsks* [*F. mollusque*, a mollusk—from *L. molluscus*, soft—from *mollis*, soft: comp. *mollusca*, a nut with a soft shell; *molluscum*, a species of fungus growing on the maple-tree]: one of a class of animals whose bodies are soft and destitute of a bony skeleton, as snails, oysters, and shell-fish in general. **MOLLUSCA**, n. plu. *mōl-lŭs'kă*, one of Cuvier's grand divisions of the animal kingdom which includes all the shell-fish proper (see above). **MOLLUSCAN**, a. *mōl-lŭs'kăn*, or **MOLLUS'COUS**, a. *-kŭs*, pertaining to or resembling the mollusca. **MOLLUSKITE**, n. *mōl-lŭs'kīt*, in *geol.*, a dark-brown carbonaceous substance occurring in shelly marbles, originating from the transmutation to mineral of the soft bodies of the mollusca. **MOLLUS'CUM**, n. *-kŭm*, in *pathol.*, a skin disease, consisting of one or more small tumors, from the size of a pea to that of a pigeon's egg. There is a true molluscum, which is contagious, and a false, which is non-contagious.

MOLLWITZ, *mōl'vĭtz*: village of Prussian Silesia, govt. of Breslau, seven m. w. of Brieg. Pop. 619.—East of it lies the celebrated battle-field where Frederick II. of Prussia gained his first victory over the Austrians under Marshal Neipperg, 1741, Apr. 10. According to the usual account, Frederick, on seeing his right wing and centre thrown into confusion and routed, put spurs to his charger, and fled from the field; but the advance of three battalions of Prussian infantry stopped the Austrians, while by this time Marshal Schwerin, who commanded on the Prussian left, routed the Austrian right wing, and compelled the whole to retreat. The Austrians suffered immense loss in killed, wounded, and prisoners. The immediate result of this victory was an alliance between France and Prussia, to dissolve which Austria was compelled to surrender the province of Silesia to Frederick 1742.

MOLLY MAGUIRES, *mōl'li ma-gwĭr'z*: name of a secret order comprising several thousand anthracite coal miners in n.e. Penn., mainly foreigners; believed to have been formed about 1854, and but little known till 1875, when they began committing murder and other outrages on mining and railroad officers. Their excesses and the difficulties precipitated by strikes, led county authorities and the officers of the Philadelphia and Reading railroad and coal companies to attempt to break up the organization. A number of Pinkerton detectives were engaged by Franklin B. Gowan, pres. of the railroad and coal companies, and a sort of guerilla warfare between the detectives and state officers, and the M. M., was kept up nearly a year. At length James McFarlan, a detective, succeeded in gaining admission to the order, by initiation, and information concerning the members and their deeds of violence; and on his testimony the leaders were arrested. An exciting trial followed, a number of the prisoners were condemned, and were hung (1877) by squads and on separate days, which struck such terror

MOLO—MOLOCH.

to their companions that the order has been heard of rarely since.

MOLO: city of the Philippine Islands, on the island of M., 4 m. from Iloilo. See PHILIPPINES. In ancient times, it was a Chinese colony, and is now occupied by Mestizos and their descendants, most of them having a mixture of Chinese blood. Pop. 16,000.

MO'LOCH: genus of saurian reptiles, of family *Agamidae* (see AGAMA). *M. horridus*, an Australian species, is perhaps the most ugly and repulsive in appearance of all the saurian tribes. The whole surface of the body is covered with irregular plates and strong sharp spines;



Moloch Horridus.

the upper surface of the head is crowned with two very large spines; and on the back of the neck are large rounded protuberances, covered with granular scales and spines. The M. is, however, entirely inoffensive.

MOLOCH, n. *mō'lōk* (more correctly MOLECH), also MILKOM, MALKOM (*their king*) [from Heb. *Melech*, king]: the chief Ammonite deity (the Chemosh of the Moabites—see MOABITES), whose worship consisted chiefly of human sacrifices, purifications, and ordeals by fire, mutilation, perpetual virginity, and the like. The name M. was originally not so much the name of an individual deity, as an honorable title indicating the supreme god of all gods. In the abominable heathen corruption of Israelitish worship, M. (sometimes Baal, 'lord,' as a synonym) was the object of the worship. This form of idolatry was specially inveighed against in the Mosaic records. Even the stranger among the Israelites who should devote his offspring to this idol was to be put to death by stoning. It is not quite certain which was the particular manner of this sacrifice. Rabbinical tradition represents M. as a human figure of brass or clay, with a crowned bull's head, upon whose extended arms were laid the doomed children. A fire within the hollow statue soon scorched them to death, while their shrieks of agony were deadened by a loud noise made by the priests on various instruments. But though this description nearly coincides with that of the statue of the Carthaginian Kronos, and though so late a traveller even as

MOLOCH.

Benjamin de Tudela speaks of having seen the remains of an ancient Ammonite temple at Gebal, with the fragments of an idol somewhat corresponding to the above representation, yet nothing certain is known about this point at present. The weight of evidence is against identification of M. with Kronos or Saturn, though the two forms of worship may have been cognate; and the offering of children by fire to M. was, as far as appears, not after the Carthaginian manner above noted, but the children, like animals offered, were first slain and then burned on the altar. The worship of M., in whatever shape it may have been, was common throughout the Canaanite nations. The Carthaginians, through whom it was probably spread over the whole East, worshipped Kronos in rites of fire and bloodshed; and human beings, children or grown-up persons, prisoners or virgins, were, either on certain periodical festivals, or on sudden emergencies, offered up throughout almost all the lands and islands which the merchant-people of antiquity may be supposed to have touched at. The description of the Kronian statue, as given by classical writers, differs only in that small respect from the one given above, that the child fell, according to the former, from the hands of the god into a burning fire below, instead of being slowly burned to death. For fire-worship in general, which is the main idea of 'Moloch,' see GUEBRES; though there is no sufficient ground for identifying M. as a form of the sun-god. The name itself gives no clue to its special nature, nor does any comparison with cognate roots lead any further. Molech, or Melech, is the supreme king or deity of the people, who have enthroned him as their tutelary god. Naturally, the princes of Ammon are the princes of *Malcham* = their (the Ammonites') king or god, and his priests were high in social rank.

Respecting the special history of this worship among the Israelites, we can only say that, though we do not see any more reason to presuppose its wide spread at early times (on account of the frequent occurrence of the word 'king' in doubtful passages), than there is the slightest ground for assuming (as has been done by Daumer and others) that the whole Mosaic religion originated in a Moloch-service (a notion which hardly required a serious refutation)—yet there is no doubt that Moloch worship had its secret, though few adherents, even before the Canaanite women in Solomon's harem reintroduced it publicly. The Valley of Hinnom and the Mount of Olives were the chief places of these abominable rites; the former being afterward adopted as the name for Hell, even in Islam. Not until the time of Josiah was this horrible idolatry rooted out from among the people. The word has now become a figurative designation for a kind of irresistible dread influence, at whose shrine everything would be sacrificed, even as the deluded father offered his own child to the terrible idol.

MOLOGA—MOLTKE.

MOLOGA, *mo-lo'gâ*: dist. town in the w. of the govt. of Jaroslav, European Russia, near the confluence of the Mologa and Volga, 68 m. w.n.w. of Jaroslav. It is a town of great antiquity, and belonged first to the principality of Rostof, afterward to Yaroslaf, but 1321–1471 it had its own princes. There was formerly an extensive fair at M. The timber-trade, and the carriage of goods by river-boats and rafts, now occupy the majority of the inhabitants. Pop. (1890) 6,885. —The river Mologa is one of the links between the Volga and the Neva.

MOLOKA'NI: Russo-Greck sect: see **MALAKANES**.

MOLOSSUS, n. *mō-lōs'sūs* [Gr. *Molossos*, belonging to the Molossians, in Epirus]: in *Gr. verse*, a metrical verse consisting of three long syllables.

MOLTEN, a. *mōl'tn* [pp. of **MELT**, which see]: made of metal by melting.

MOLTKE, *mōlt'kēh*, **HELLMUTH**, Count von: 1800, Oct. 26—1891, Apr. 24; b. Mecklenburg, long the seat of his family: field-marshal of the German army. He was chief of the general staff, and planned the Prussian campaign of 1866 against Austria, and the German campaign of 1870–1 against France. Soon after his birth, his father, a military officer, left Mecklenburg, and acquired an estate in Holstein. He and his brother were sent to the military acad. in Copenhagen, where iron discipline and military frugality laid the foundation of his later character. In 1822, he entered the Prussian army as cornet. His parents having by this time lost all their fortune, he was left without any pecuniary means, and had to undergo many hardships to maintain himself in his position—the pay of the Prussian officers being very small; yet he managed to save enough to take lessons in modern languages, which afterward proved of great advantage. His eminent abilities soon procured him a place in the general staff. 1835–39, he was in Turkey and Asia Minor, whither he was sent by the Prussian govt. to report on the war between that country and Mehemet Ali. Several anonymous publications of his, descriptive of the country and the war, are noticeable. After his return, he rapidly advanced through the different stages to the rank of general, continuing, however, on the general staff. His wonderful strategical powers were of immense service in the wars with Denmark (1863–4), Austria (1866), and France (1870–1); bringing them all to triumphant issues. At the end of the Austrian war he was rewarded with the order of the Black Eagle, 1870 he was created a count, and 1871 he was raised to the rank of field-marshal. He published a work on the Franco-German war; and *Letters from Russia* (1881, but written many years before in his early manhood). M. was a man of great modesty and simplicity; reserved, and little given to talk. See **GERMANY**: also Müller's *Life of M.*, trans. by Pinkerton (1879).

MOLUCCAS.

MOLUCCAS, *mō-lūk'kaz*, THE, or ROYAL ISLANDS: properly (as distinguished from the M. or SPICE ISLANDS), the islands Ternate, Tidore, Makian, Motir, and Batjan, lying w. of Gilolo, and washed by the Moluccas Strait or Passage, which separates Gilolo from Celebes.—Ternate, the most important, is a volcanic mountain with plains at its base. The top is in $0^{\circ} 48' 30''$ n. lat., and $127^{\circ} 26' 30''$ e. long.; area, $33\frac{1}{2}$ sq. m. Pop. 8,594, of whom 109 are Europeans. The town is on the e. side and contains the sultan's palace, the Dutch residency, Prot. church, govt. school, etc. The island is fertile and well watered; the natives peaceful. They cultivate rice, cotton, tobacco, etc., trade with the adjacent islands, and build vessels, from the light skiff and the tent-boat to the war-galley of 60 or 80 rowers, carrying two or more pieces of light artillery.—Tidore is s. of Ternate, its n. point being $1^{\circ} 11'$ n. lat., and $126^{\circ} 7'$ e. long.; area, 33 sq. m. Pop. 8,500. The island is a volcano, 5,532 ft. high, and fertile for 3,000 ft. The natives are less gentle, but more industrious than those of Ternate, and diligently cultivate the soil, weave, and fish. They are Mohammedans, and have many mosques. The sultans of Ternate and Tidore are subsidized by and subject to the Netherlands, exercising their authority under the surveillance of the Resident.—Makian lies in $0^{\circ} 18' 30''$ n. lat., and $127^{\circ} 24'$ e. long., is very fertile, yields much sago, rice, tobacco, canary-oil, etc., and has important fishings. Pop. 5,000. The natives are industrious, make good nets, spin yarns, and weave coarse striped fabrics.—Further n., in $0^{\circ} 28'$ n. lat., and $127^{\circ} 29' 30''$ e. long., is Motir, which formerly yielded a considerable quantity of cloves, and later sent much earthenware to all the Spice Islands.

Batjan, the only remaining Royal Island, lies between $0^{\circ} 13'$ — $0^{\circ} 55'$ s. lat., and $127^{\circ} 22'$ — 128° e. long.; 50 m. in length and 18 in breadth; has many mountain peaks 1,500 to 4,000 ft. in height, the sources of numerous streams. The greatest part of this beautiful island is covered with ebony, satin-wood, and other valuable timber trees, which give shelter to numerous beautiful-plumaged birds, deer, wild hogs, and reptiles. Sago, rice, cocoanuts, cloves, fish, and fowls are plentiful, and a little coffee is cultivated. Coal is abundant, gold and copper are in small quantities. The inhabitants, numbering 1,800, are lazy and sensual, a mixed race of Portuguese, Spaniards, Dutch, and natives. These islands all are volcanic, Ternate being a mountain, sloping upward to 5,563 ft., to which Tidore bears a striking resemblance. Makian is an active volcano, which, so late as 1861, Dec., threw forth immense quantities of lava and ashes, by which 326 lives were lost, and 15 villages in part or in whole destroyed. Motir is a trachyte mountain, 2,296 ft. in height; and Batjan, a chain with several lofty peaks. Total pop. of the M. proper, 25,000.

South-w. of Batjan is the Obi group, consisting of Obi Major, Obi Minor, Typha, Gonoma, Pisang, and Maya, of which Obi Major, $1^{\circ} 35'$ s. lat., and 127° to 128° e. long.,

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is by far the largest, 598 sq. m. It is hilly and fertile, being covered, like the smaller islands of the group, with sago and nutmeg trees. The islands of this group are uninhabited, and serve as lurking-places for pirates and escaped convicts. In 1671, the Dutch built a block-house, called the Bril; and a few years later, the sultan of Batjan sold the group to them for \$800; but the station being found unhealthful, the company abandoned it 1738.

The MOLUCCAS, or SPICE ISLANDS, in the broad use of the term, lie e. of Celebes, scattered over nearly 11 degrees of lat. and long., 3° s.— 8° n. lat., and 126° — 135° e. long., including all the territories formerly ruled by the sultans of Ternate and Tidore. They comprise all the islands of the E. Indian archipelago, between Celebes on the w., the Papuan Islands and New Guinea on the e., Timor on the s., and the open Pacific on the n.; abt. 450 m. from e. to w., and 800 m. from n. to s. They are divided into the residencies of Amboyna (q.v.), Banda (q.v.), and Ternate; a fourth residency being Menado (q.v.). Over the n. groups of the Spice Islands, the Netherlands exercise an indirect government, the sultans of Ternate and Tidore being required to have all their appointments of native officials ratified by the resident. The s. groups are directly under European rule. The residency of Amboyna contains that island, sometimes called Ley-Timor, or Hitu (from the two peninsulas of which it is formed), Buru, the Uliassers group, and the w. part of Ceram. That of Banda includes the Banda, Keffing, Key, Arru, and other islands, also the e. portion of Ceram. Under the residency of Ternate are placed the M. proper, Gilolo, the neighboring islands, and the n.w. of Papua. Pop of the M. and dependencies, about 5,000 Europeans and 800,000 natives.

Amboyna, the Banda and Uliasser Islands, chiefly supply the cloves, nutmegs, and mace which form the staple exports. The Banda Islands are Neira or Banda-Neira, Great Banda, Ay or Way, Rhun, Rozingain, and Goenong-Api; 588 sq. m. Pop. 7,000, of whom 500 are Europeans; that of the whole residency 150,000, including the e. part of Ceram. The principal island of the group is Neira, s.e. from Amboyna, $4^{\circ} 33'$ s. lat., and 130° e. long., separated by narrow straits from Goenong-Api on the w., and Great Banda on the east. The coast is steep, and surmounted by several forts and batteries, which command the straits and roadstead. The town of Neira, on the s. side of the island, is cap. of the Dutch residency of Banda, has a Prot. church, school, and hospital. The Banda Islands have rich soil, and are planted with nutmeg-trees, which produce in one year more than a million lbs. of nuts, and near 300,000 lbs. of mace. The culture has nearly doubled since 1851. Pine-apples, the vine, banana, cocoa-nut, and other fruit-trees thrive, and are abundant. Ay is the prettiest and most productive of the group. Goenong-Api is a lofty volcano. There are wild cows, hogs, and deer; sea-carp and mackerel,

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which last are dried, and form with sago the food of the slaves. The e. monsoon begins in May, and the w. in Dec., and are accompanied with rain and storms. The climate is not very healthful.

The Uliassers, which, with Amboyna, produce the cloves of commerce, are Saparoua, Oma or Haroukou, and Nousa-Laut. They lie e. of Amboyna, $3^{\circ} 40'$ s. lat., and $128^{\circ} 33'$ e. long.; $107\frac{1}{2}$ sq. m. Saparoua is the largest, and is formed of two mountainous peninsulas, joined in the middle by a narrow strip of undulating grassy land. Recently there were about 100,000 trees producing 185,000 lbs. of cloves. Pop. 11,635, of whom 7,340 are Christians, and have 12 schools, with very large attendance of scholars.—Oma, separated from Saparoua by a strait of a league in width, has 11 villages, of which Harouka and Oma are chief. It is mountainous in the s., and has several rivers and sulphurous springs. The produce of cloves has amounted in one year to 40,000 lbs.; and the villagers possess 50,000 cocoa palms, besides other fruit-trees. The woods abound with deer and wild hogs, the rivers with fish. Sago is grown, but not in sufficient quantities to meet the wants of the people, who draw further supplies from Ceram. The beautiful village of Harouka, on the w. coast, is the residence of the Dutch postholder, who is pres. of the council of chiefs. Here is the head office of the clove-produce. There are two forts on Oma, several churches, and six schools, with 700 pupils. Pop. 7,500, one-half Christians, the other Mohammedans.—Nousa-Laut lies s.e. of Saparoua. It is planted with clove-trees, which in one year produced 120,000 lbs. There are more than 30,000 cocoanut-trees. Pop. 3,479, formerly pirates and cannibals, all now Christians, with schools in every village—attended (1859) by 870 pupils.

The clove-tree and the nutmeg are indigenous to all the Spice Islands, but the clove-cultivation is confined to Amboyna and the Uliassers, the nutmeg to the Banda Islands. Till 1824, the Dutch prohibited the planting of these trees in other parts, and caused those of native growth to be rooted out, in order to prevent smuggling, and to retain the supply of these spices to the European market. The Spice Islands are generally healthful both for Europeans and for Asiatics; and though the plains are sometimes very hot, mountains are always near, where it is pleasantly cool in the mornings and evenings. Besides the spice-trees, the bread-fruit, sago, cocoa-nut, banana, orange, guava, papaw, also ebony, iron-wood, and other valuable timber-trees, are abundant. The natives of some of the islands are Alfoers; of others, Malays on the coasts, and Alfoers in the interior. In Ceram are also Papuan negroes, brought originally from Bali and Papua as slaves.

The resident and other Dutch officials reside in the city of Amboyna, the streets of which intersect at right angles, are broad, and planted with rows of beautiful trees: see AMBOYNA.

MOLY—MOLYBDENA.

The native inhabitants of the Moluccas in the wider sense, belong to two or three different stocks, now much intermingled, Malays, Papuans, perhaps also Polynesians. There are numerous descendants of the early Portuguese settlers, known as *Orangsirani*, i.e., Nazarenes, and speaking a language compounded of Malay and Portuguese. They are now mostly Protestants. Slavery has introduced numerous foreign elements into the population. Everywhere Chinese are found; and often Arab merchants, having native wives. A great volcanic belt passes through the M. and gives them their distinctive character; but many of the islands have no volcanoes, and some seem to be non-volcanic in origin. The vegetation as a whole is extremely rich, but has not yet been thoroughly investigated. The animal life belongs to the Australian type, and closely resembles that of New Guinea. Some Asiatic mammals, such as deer, are found, especially on the large islands. None of the islands but Batjan has any monkeys; and the mammals altogether are few in number. Birds are numerous and varied. Of 200 species of land-birds, 140 are peculiar to the islands; parrots, pigeons, and kingfishers are by far the most numerous kinds, and constitute a third of the whole.

In 1521, Antonio de Brito first appeared to take possession of the M. in the name of the king of Portugal; and after a long period of violence, intrigue, and perfidy, the Portuguese were driven out by the Dutch and natives, at the beginning of the 17th c. The change was of no advantage to the natives, for the Dutch, having obtained the exclusive right of buying all the cloves, at a nominal value, a series of wars ensued, which resulted in the subjugation of the Spice Islands. Recently, new sultans of Ternate and Tidore have been appointed, with less power than their predecessors; and the wars with the Alfoers of Ceram, 1859-60, have brought them more fully under Dutch rule, with a decided improvement in their condition.

MOLY, n. *mō'li* [Gr. *mōlū*; L. *mōly*, moly]: wild garlic—the *Allium moly*; a fabulous herb having a white flower and a black root, mentioned by Homer as possessing magic power against the charms of Circe; the *Allium magicum*, ord. *Liliacææ*. A reminiscence of the Circean legend is probably still traceable in the garlic called Sorcerer's Garlic.

MOLYBDENA, n. *mōl'ib-dē'nă*, or **MOLYBDENITE**, n. *mōl-ib'gēn-īt* [Gr. *molubdai'na*, a mass of lead—from *molubdos*, lead: L. *molybdæna*]: molybdic sulphide, MoS_2 , an ore found in various rocks, and in veins with tin and other ores, closely resembling in color that of fresh-cut metallic lead. **MOLYBDENUM**, n. *mōl'ib-dē'nŭm*, an elementary body forming a very rare, white, brittle metal, obtained with difficulty from its ore, molybdenite. Molybdenum (sym. Mo; equiv. 96; sp. grav. 8.62) is a rare metal, which, in a state of purity, is of silvery white color, has a strongly metallic lustre, is brittle, and very

MOMBASA—MOME.

difficult of fusion. It never occurs native, and its principal ore is the bisulphide, Molybdenite, which much resembles graphite. It is also occasionally found oxidized, in molybdate of lead, Wulfenite. The metal may be obtained by roasting the bisulphide in a free current of air, when the sulphur goes off oxidized as sulphurous oxide, and the M. also is oxidized into trioxide, commonly called Molybdic Acid (MoO_3), and remains in the vessel. By the action of charcoal the reduced metal is then obtained from this oxide.

Molybdenum forms three compounds with oxygen—the protoxide (MoO), the linoxide (MoO_2), and trioxide (MoO_3). Of these three, the last alone has any practical value. Molybdic acid, as it is often called, is a white, glistening, crystalline powder which is almost insoluble in water, fuses at a red heat, and unites with bases to form well-marked salts, the molybdates, which are either colorless or yellow. A solution of molybdate of ammonia is one of the most delicate tests for phosphoric acid.—Molybdenum forms various compounds with sulphur, chlorine, etc., none of which are of practical importance, except the native bisulphide. **MOLYBDEOUS**, a. *n* òl-ìb'-dūs, or **MOLYB'DIC**, a. -āk, pertaining to molybdenum, or obtained from it. **MOLYBDATE**, n. *m* òl-ìb'-aāt, a compound of molybdic acid with a base.

MOMBASA, *m* ċm-lā'sā, or **MOMBAZ**, *m* ċm-lās': seaport town of e. Africa, in the territory of the sultan of Zanzibar, on a small coralline island off the coast, in the middle of an estuary formed by two small rivers, lat. $4^{\circ} 4' \text{ s.}$, long. $39^{\circ} 43' \text{ e.}$, about 150 m. n. of Zanzibar Island. The shores of the island are rocky and abrupt; and though the channel may be forded at low water, the attempt is attended with danger. The town has the usual Arab characteristics of ruin, neglect, and filth in a striking degree. The only object of interest is an extensive fort, on a rock, cut perpendicularly, 1596, by the Portuguese, and restored by them 1635, as an inscription over the principal gateway indicates. It is a work of considerable pretension, with more than 100 guns in position, but in ruinous condition. The inhabitants, the majority of whom are sunk in abject poverty, mostly live in wretched hovels, scattered among what remains of the once magnificent buildings. The harbor is still good, and is commodious and safe. M. was visited by Vasco da Gama 1497, when he found it a large and very prosperous town. It was held by the Portuguese during most of the period 1529–1720. The English held it 1824–26, when they resigned it. Since then, it has been possessed by the sultan of Zanzibar. Pop. (1883) about 20,000. M. was ceded to the Brit. E. African Co. 1888.

MOME, n. *m* ōm [imitative word]: for *mum*, silence; a dull, stupid, silent person.

MOMENT—MOMENTUM.

MOMENT, n. *mō'měnt* [F. *moment*—from L. *momen'tum*, movement, a very small portion of anything—from *movēō*, I move: It. *momento*]: the smallest possible portion of time; the unit of time; an instant; one-sixtieth part of a minute; importance; value; force.—The *Moment* of any physical agency, is its importance with reference to some special application. Thus, the moment of a force applied (perpendicularly) to a lever, is the importance of the force as regards turning the lever about its fulcrum. It is, as we know (see **LEVER**), proportional to the product of the force by the distance of its point of application from the fulcrum. The moment of a force about any axis (to which its direction is perpendicular) is the product of the force by its least distance from the axis; and a similar definition is laid down for moment of velocity and moment of momentum. It is easy to see (see **MOMENTUM**) that in any system of mutually acting bodies the moment of momentum about any axis remains constant, since the equal mutual forces measure the momentum transferred from one body to another, and the moments of these forces are in pairs equal and opposite. A particular case of this is Kepler's law that each planet describes equal areas in equal times about the sun. *Moment of Inertia* in the rotation of bodies round an axis, is the sum of the products of each particle of the body into the square of its distance from the axis; or if *M.* be the body, m_1, m_2, m_3 , etc., the particles composing it, and r_1, r_2, r_3 , etc., their corresponding distances from the axis, then the moment of inertia of $M = m_1r_1^2 + m_2r_2^2 + m_3r_3^2 +$, etc.; and if a quantity, k , be found such that $Mk^2 = m_1r_1^2 + m_2r_2^2 + m_3r_3^2 +$, etc., then k is called the *radius of gyration*. See **CENTRE OF GYRATION**. **MOMENTARY**, a. *mō'měnt-ēr-ī*, done in an instant; lasting an extremely short time. **Mo'MENTARILY**, ad. *-ēr-ī-lī*, or **Mo'MENTLY**, ad. *-lī*, for a moment; every moment. **MOMENTOUS**, a. *mō-měnt'ūs*, important; weighty; of great consequence. **MOMENT'OUSLY**, ad. *-lī*. **MOMENT'OUSNESS**, n. *-nēs*, state of being of the utmost consequence. **MOMENTUM**, n. *mō-měnt'ūm*, impetus; in *mech.*, quantity of motion in a moving body; the product of the mass by the velocity of a moving body (see below).—**SYN.** of 'moment': weight; consequence; avail; signification; consideration; twinkling; momentum.

MOMENTANY, a. *mōm'ěn-tă-nī*: *OE.* for **MOMENTARY**.

MOMEN'TUM, or **QUANTITY OF MOTION**: quantity defined by Newton as proportional to the mass moving, and its velocity, conjointly. If we assume unit of *M.* to be that of unit of mass moving with unit of velocity, we shall evidently have, for the *M.* of a mass *M*, moving with velocity *V*, the expression *MV*. And such is the unit generally adopted.

It is shown by experiment that, when force produces motion in any body, the *M.* produced in one second is proportional to the force—and, in fact, *force is measured by the momentum that it is capable of producing in unit of*

time. Thus, the same force, if acting for one second on each of a number of bodies, produces in them velocities which are *inversely* as their masses. Also when, as in the case of falling bodies, the velocities produced in one second are the same in all, we conclude that the forces are *proportional* to the masses; and, in fact, this is the physical proof that the weight of a body is proportional to its mass. Again, if different forces act, each for a second, on the *same* mass, the velocities produced are proportional to the forces. All these are but different modes of statement of the experimental fact, that force is proportional to the M. that it produces in unit of time; which forms a part of Newton's second Law of Motion.

When two masses act on each other, Newton's third Law of Motion (see MOTION, LAWS OF) shows that the forces that they mutually exert are equal and opposite. The momenta produced by these must therefore be equal and opposite. Thus, in attraction or impact of two masses, *no momentum is lost*; since what is lost by one is gained by the other.

The M. of a system of bodies can be resolved (as velocity is resolved) into components in any assigned directions, likewise the mutual forces of the system may be thus resolved. Applying the previous result, we see at once that in any system of mutually acting bodies (such, for instance, as the solar system), no M. is, on the whole, either gained or lost in any particular direction; it is merely transferred from one part of the system to another. This fact, called the Conservation of M., has caused great confusion in the minds of pseudo-physicists, who constantly confound it with Conservation of Work or Energy, a totally different thing.

The M. produced by a force in any period of time is measured by the product of the force and the *time during which it has acted*—the energy or work done by a force is measured by the product of the force and the *space through which it has acted*. M. is proportional to the simple velocity of a body, and *can never, by any known process, be transformed into anything else*. Energy, when depending on velocity (see FORCE, CONSERVATION OF), is proportional to the *square* of the velocity, and is in the natural world *constantly being transformed from its actual or kinetic form to its potential form, and back again, or to some other kinetic form such as heat, and finally must become heat*. M., on the contrary, is never altered, either in kind or in amount.

In *knocking down* a wall, or in staving in the whole side of a ship, the battering-ram of the ancients (when constructed of sufficient mass, and worked by the proper number of men or animals) was probably nearly as effective as the best modern artillery. But in making a *breach* in a wall, or in punching a hole in the armor of an iron-clad, mere massive shot with low velocities (such as those of the Dahlgren guns) are comparatively ineffective, however great their M.; while an Armstrong or Whit-

worth projectile, with a fraction of the M., but with great velocity, and, for its size, much greater kinetic energy, effects the object with ease. In many every-day phenomena, we see distinctly the difference between these two affections of matter. Thus, a blow delivered from the shoulder by a *heavy* pugilist, even if it be sluggishly given, generally floors the antagonist, without doing much other injury; but a sharp stroke administered by a *lightweight*, while hardly disturbing the adversary's equilibrium, inflicts serious hurt.

MOMIERS, n. *möm'z-ërz* [F. *momier*—from OF. *momer*, to mumm (see MUMM)]: on the *continent* of Europe, term of reproach or contempt—applied to certain sectaries among Protestants, particularly in Switzerland, and adjacent parts of France and Germany. The M. held the doctrines of the divinity of Christ and the total depravity of the human race, and resided principally in the French cantons of Switzerland where these and other Calvinistic tenets had been almost wholly abandoned. Indeed, preaching on some of these 'debatable doctrines' had been forbidden by the Association of Pastors in the established (Presb.) church. This order was disregarded by the leader of the M., Cæsar H. A. Malan, D.D. (q.v.); and he was shut out of the pulpits of Geneva, and held services at his house, and later at a chapel which he built, though he did not separate himself from the established church. The M. were very fervent in their services and vigorous in their denunciation of the prevalent departure from the reformed faith. They were subjected to ridicule, opposition, and restraint; received great aid from Robert Haldane (q.v.); and having reawakened an evangelical interest in Switzerland and adjacent parts of France, the M. in large part became merged again in the church.

MOMMSEN, *möm'sën*, THEODOR: writer on the history and polity of ancient Rome: b. 1817 at Garding, in Slesvig, where his father was pastor in the Lutheran Church. M. studied first at Altona, subsequently at the Univ. of Kiel, where he graduated in arts 1843. Having obtained assistance from the Acad. of Berlin to defray the expenses of a prolonged course of travel, M. spent three years in investigating Roman inscriptions in France and Italy, and published the results in the *Annals of the Archaeological Institute of Rome and the Herculanean Acad. of Naples*. The political disturbances of 1848 diverted M. from his favorite pursuits; and for a time he engaged in politics, taking the editorship of the leading Slesvig-Holstein paper, for which he wrote the leading articles in the summer of 1848. He held for a short time a chair in the Univ. of Leipzig, but his appointment was cancelled on account of his strong political tendencies. He was made titular prof. of law at Zurich 1852, and at Breslau 1854; and since 1858 he has filled the chair of Roman law at Berlin. His attention has long been given to those branches of archeology and ancient history with which his name is now so honorably associated. Among

MOMORDICA—MON.

his most valuable contributions, special mention must be made of the following: *Die Unteritalischen Dialekte* (Leip. 1850), *Corpus Inscriptionum Neapolitanarum* (Leip. 1851); his monographs on *The Chronography of the Year 354*, and *Roman Coins* (Leip. 1850); the edict of Diocletian, *De Pretiis Rerum Venalium* A. 301 (Leip. 1851); *Inscriptiones Regni Neapolit.-Latinæ*, 1852; *Die Rechtsfrage zwischen Cæsar und d. Senat*, 1857; his great work on Roman history, *Röm. Geschichte*, 1854-56, 7th ed. 1881 (ably trans. into English by W. P. Dickson); *Römische Forschungen* (1864); *Res Gestæ Divi Augusti* (1865); *Römisches Staatsrecht* (2d. ed. 1877); *Die Erzählung von Caius Martius Coriolanus*; and *Digesta Justiniani Augusti* (1868-72). His very valuable library was destroyed by fire 1880.

MOMORDICA, *mō-mawr'dī-ka*: genus of plants of nat. order *Cucurbitaceæ*, having lateral tendrils, and the fruit splitting when ripe. *M. Balsamina*, native of s. Europe and of the East, produces a curious, oblong, much-warted fruit, the **BALSAM APPLE**, which, when green, is infused in oil, to form a vulnerary much esteemed in Syria and some other countries. The ripe fruit is a dangerous poison. The plant is used to form arbors.—The large, red, thorny fruit of *M. mixta*, called *Gol-kakra* in India, is there used for food.—*M. echinata* is called the *Gooseberry Gourd*, because its fruit, covered with bristles, is about the size and shape of a large gooseberry. The unripe fruit is used for pickling, and is sometimes seen in Covent Garden market, London.

MOMOTOMBO: highest volcano in Nicaragua, the extremity of the Marrabios Mts., at the head of Lake Managua, about 25 m. n.e. of the city of Leon. It is 7,200 ft. high, of which nearly 3,000 ft. is formed of the scoriæ ejected during eruptions. It is still active, sending out smoke and occasional showers of ashes. It has several vents on its sides, while at its base are a number of hot springs. The summit of M. has never been reached, though Victor Hugo's *La Légende des Siècles* embodies the legend of an ascent by Spanish priests to plant the cross upon it, who were never heard of afterward. The volcano can be seen far out at sea.

MOMPOX, *mōm-pōch'*: town of the United States of Colombia, on the Magdalena, 110 m. s.e. of Cartagena. Here the Magdalena, during its periodical floods, rises 12 or 15 ft. above its usual level; and the quay and custom-house of M. are built unusually high, to provide against this emergency. All foreign goods for the consumption of the Valley of the Magdalena pass through this town. Pop. estimated 10,000.

MOMUS, n. *mō'mūs* [Gr. *momos*, derision]: in *anc. myth.*, the god presiding over ridicule, mirth, and railery, aiming his mocking censure at men and at the gods, and therefore expelled from heaven.

MON, *mōn*, or **MONO**, *mōn'ō* [Gr. *monos*, alone]: a prefix, signifying alone; single; solitary; only one.

MONACHAL—MONACHISM.

MONACHAL, a. *mōn'ă-kāl* [Gr. *mon'achos*, a monk—from *monos*, alone: It. *monacale*: F. *monacal*]: pertaining to monks or a monastic life; living alone; solitary. **MON'ACHISM**, n. *-kīzm*, the system, the influences, and the state of a monastic life (see below).

MON'ACHISM, or **MONAS'TICISM**: in general a state of religious retirement, more or less complete, accompanied by contemplation, and by various devotional, ascetical, and penitential practices; in especial the corporate life of religious communities, in poverty and celibacy, and under a fixed discipline. It is, in truth, **ASCETICISM** (q.v.), with the element of religious solitude superadded. The institution of M. has, under different forms, entered into several religious systems, ancient and modern. That it was known among the Jews before the coming of Christ, appears from the example of the prophet Elias, and from that of the Essenians; and it is probable that religious seclusion formed part of the practice of the **NAZARITES** (q.v.), at least in the later periods of Jewish history. In the Brahmanical religion, it has had prominent place; and even to the present day, the *lamaseries* of Tibet may be said to rival in number and extent the monasteries of Italy or Spain. The Christian advocates of M. find in the gospel exhortations to voluntary poverty (Matt. xix. 21) and to celibacy (I Cor. vii. 37), at once the justification and the origin of the primitive institution. Its first form appears in the practice of asceticism, of which we find frequent mention early in the 2d century. The primitive ascetics, however, lived among the brethren, and not till the 3d c. did the peculiar characteristic of M. appear in the church. The earliest form of Christian M. is also the most complete—that of the **ANCHORITES** (q.v.); and is commonly believed to have in part originated in the persecutions, from which Christians were forced to retire into deserts and solitary places. The anchorets maintained from choice, after the cessation of the persecutions, the seclusion to which they had originally resorted as an expedient of security; and a later development of the same principle is found in the still more remarkable psychological phenomenon of the celebrated **PILLAR-SAINTS** (q.v.). After a time, however, the necessities of the religious life itself—as the attendance at public worship, the participation of the sacraments, the desire for mutual instruction and edification—led to modifications of the degree and of the nature of the solitude. First came the simplest form of common life, which sought to combine the personal seclusion of individuals with the common exercise of all the public duties; an aggregation of separate cells into the same district, called by the name *Laura*, with a common church, in which all assembled for prayer and public worship. From the union of the common life with personal solitude is derived the name *cenobite* (Gr. *koinos bios*, common life), by which this class of monks is distinguished from the strict solitaries, as the anchorets or eremites, and in which is involved, in addition to the obligations

of poverty and chastity, which were vowed by the anchorites, a third obligation of obedience to a superior, which, in conjunction with the two former, has ever since been held to constitute the essence of the 'religious' or monastic life. For the origin of the strictly cenobitical or monastic life, see ANTONY, SAINT: he may be regarded as its founder in the East, either by himself or by his disciples. So rapid was its progress, that his first disciple, PACHOMIUS (q.v.), lived to find himself the superior of 7,000. In the single district of Nitria, there were no fewer than 50 monasteries (Sozomen, *Eccles. History*, vi. 31), and before long, the civil authorities judged it expedient to place restrictions on their excessive multiplication. It seems to be admitted, that, in the East, where asceticism has always been held in high estimation, the example of Christian M. had a powerful influence in forwarding the progress of Christianity; though it is also certain that the admiration which it excited occasionally led to its natural consequence among the members, by eliciting pride and ostentation, and by provoking, sometimes to fanatical excesses of austerity, sometimes to hypocritical simulations of rigor. The abuses which arose, even in the early stages of M., are deplored by the very Fathers who are most eloquent in their praises of the institution itself. These abuses prevailed chiefly in a class of monks called *Sarabaitæ*, who lived in small communities of three or four, and sometimes led a wandering and irregular life. On the other hand, an extraordinary picture is drawn by Theodoret, in his *Religious Histories*, of the rigor and mortification practiced in some of the greater monasteries. The monks were commonly zealous in religion; and much of the bitterness of the religious controversies of the East was due to that unrestrained zeal; and it may be added that the opinions which led to these controversies originated mostly among the theologians of the cloisters. Most famous among these were an order called *Acæmetæ* (Gr. sleepless), from their maintaining the public services of the church day and night without interruption. See MONOPHYSITES: MONOTHELISM: NESTORIANS: IMAGE-WORSHIP.

It was in the cenobitic rather than the eremitic form that M. was introduced into the West, at Rome and in n. Italy by Athanasius; in Africa by St. Augustine; and afterward in Gaul by St. Martin of Tours. Here also the institute spread rapidly under the same general forms in which it is found in the Eastern Church; but considerable relaxations were gradually introduced, and it was not until the thorough reformation, and, as it may be called, religious revival effected by the celebrated St. BENEDICT (q.v.), in the beginning of the 6th c., that western M. assumed its peculiar and permanent form. In some of the more isolated churches, e.g., that of Britain, it seems that the reformations of St. Benedict were not introduced until a late period; and in that church, as well as in the church of Ireland, they were a subject of considerable controversy. One of the most important modifications

of M. in the West, regarded the nature of the occupation in which the monks were to be engaged during the times not directly devoted to prayer, meditation, or other spiritual exercises. In the East, manual labor formed the chief, if not the sole external occupation prescribed to the monks; it being held as a fundamental principle, that for each individual the main business of life was the sanctification of his own soul. In the West, besides the labor of the hands, mental occupation also was prescribed, not for all, but for those for whom it was especially fitting. From an early period, therefore, the monasteries of the West, particularly of Ireland, or of the colonies, founded by Irish monks, e.g., Iona and Lindisfarne, became schools of learning, and training-houses for the clergy. At a later period, most monasteries possessed a *scriptorium*, or writing-room, in which the monks were employed in the transcription of MSS.; and though a great proportion of the work so done was, as might naturally be expected, in the department of sacred learning, yet it cannot be doubted that to the scholars of the cloister we owe the preservation of most of those masterpieces of classic literature which have reached our age.

In the remarkable religious movement which characterized the church of the 12th c. (see FRANCIS OF ASSISI: FRANCISCANS), the principle of M. underwent a further modification. The *spiritual egotism*, so to speak, of the early M., which in some sense limited the work of the cloister to the sanctification of the individual, gave place to the more comprehensive range of spiritual duty, which, in the institute of the various bodies of FRIARS (q.v.), which that age produced, made the spiritual and even the temporal necessities of one's neighbor equally with, if not more than, one's own, the object of the work of the cloister. For the progress of these various bodies, in the 12th c. and since, see their several titles. It remains to detail the later history of M., properly so called. Almost all the monastic institutes of the West are offshoots or modifications of the BENEDICTINES (q.v.); of these, the most remarkable are the CARTHUSIANS, CISTERCIANS, GRANDMONTINES, CLUGNIACS, PREMONSTRATENSIS, and above all MAURISTS, or Benedictines (q.v.) of St. Maur. In more modern times, other institutes have been founded for the service of the sick, for the education of the poor, and similar works of mercy, which also are classed under the denomination of monks. For the most important of these, see their several titles.

The inclosure within which a community of monks reside is called a MONASTERY (q.v.) —Gr. *monasterion*, Lat. *monasterium*. By the strict law of the church, called the law of cloister or inclosure, it is forbidden to all except members of the order to enter a monastery; and in almost all the orders, this prohibition is rigidly enforced as regards the admission of females to the monasteries of men. To such a length is this carried in the Greek Church, that in the celebrated inclosure of Mount Athos, not only women, but all animals of the female

sex are rigorously excluded. The first condition of admission to a monastic order is the approval of the superior, after which the candidates remain for a short time as *postulants*. After this preliminary trial, they enter on what is called the *novitiate*, the length of which in different orders varies from one to three years; and at its close they are admitted to the profession, at which the solemn vows are taken. The age for profession has varied at different times and in different orders; the Council of Trent, however, has fixed 16 as the minimum age. Originally, all monks were laymen; but after a time, the superiors, and by degrees other more meritorious members, were admitted to holy orders. For the distinction of priest-monks and lay-brothers, see **FRIAR**; but in both alike, where the order is one of those solemnly approved by the church, the engagement taken at the final profession is life-long and irrevocable.

The monastic institute, from the very earliest time, embraced women as well as men. The former were called in Greek by the name *nonis* or *nonna*, and in Latin *nonna* (from which the English *nun*), as also *sanctimonialis*. The cloistered residence of nuns is called by various names, as **NUNNERY**, **CONVENT**, a name applied to the houses of men also. The general characteristics of the monastic institute for women are substantially identical with those for men: see the respective titles of the principal varieties of institute.

The reformed churches in the 16th c. discarded the practice of M., and the monastic houses were suppressed by Prot. governments. In some of the German states, the temporalities of the suppressed monasteries were retained, and were granted at pleasure by the sovereign, together with the titular dignity. Some of the German churches, however, in later times, have revived the institute both for men and for women, as has been done also in the Anglican Church both in the time of Laud and in our own day. In all these Prot. revivals of M., however, the engagement is revocable at the will of the individual. At the French Revolution, the monastic establishments of France were utterly suppressed; and in most of the other Rom. Cath. countries of Europe, the example has been followed to a greater or less extent. In England and Ireland and the United States, on the contrary, the institute has made rapid progress of late years. Most of the orders introduced are of the active rather than of the contemplative class. Besides references above, see **BROTHERHOODS**: **SISTERHOODS**: **BROTHERS AND SISTERS OF CHARITY**.

MONACO, *mŏn'â-kō*: smallest of European sovereign principalities; surrounded by French territory, on the Mediterranean coast, a few miles n.e. of Nice. It has long been notorious for the public gaming-tables, supplying great part of the revenues of the prince, at Monte Carlo (q.v.), e. of the town of M. The climate is fine, so that palms and aloes grow luxuriantly. From the 10th to the 18th c., M. was held by the Genoese family of Grimaldi. In 1815, it was ceded to Sardinia, which, however, recognized its independence, but reserved to itself the right of garrisoning the town of M. At this period, it consisted of three communes—Monaco, Mentone, and Roccabruna, with 52 sq. m., and pop. about 7,000. In 1848, Mentone and Roccabruna were annexed to Sardinia, in spite of a protest by his 'serene highness,' Carlo Honorio, third prince of M. The Italian war of 1859 placed the whole territory for a brief period under Victor Emmanuel; but Carlo Honorio sold Mentone and Roccabruna (1861) to the French emperor for 4,000,000 francs. M. itself is now also under French protection. The sovereign prince of M. possesses nothing but the city and a small patch of territory, total area 6 sq. m.; pop. (1900) 15,180.—The town of M. is a beautiful place on a rocky promontory; pop. (1890) 3,292; (1900) 3,292.

MONAD, n. *mŏn'ād* [F. and It. *monade*—from mid. L. *monādem*, a unit: Gr. *monas* or *monāda*, unity, a monad—from *monos*, alone]: an indivisible thing; that which is one; an ultimate atom: for *Monad*, in philosophy, see below. In *chem.*, a univalent element—that is, one whose atom, like hydrogen, is supposed to have only one combining point; the simplest and extremely minute kind of microscopic animalcules (see below, **MONAD**, in *Biology*): a primary cell. **MONADIC**, a. *mŏn-ād'ik*, or **MONAD'ICAL**, a. *-ī-kāl*, resembling a monad.

MON'AD, in *Biology*: generic name of many kinds of microscopic organisms, very minute, and supposed to be also of very simple organization. They appear, even under a powerful microscope, as mere points, moving rapidly through the fluid in which they exist, and often becoming aggregated in clusters; or they are seen to be gelatinous and globular, or nearly so, with a tail or thorn-like filament, by the vibrations of which they move. When the fluid is tinted by means of some harmless coloring matter, the existence of several cells or vesicles is discerned within the minute body. Ehrenberg therefore classed them among Polygastric Infusoria (see **INFUSORIA**), and no naturalist doubted their right to a place, though one of the lowest, in the animal kingdom. They are now universally regarded as vegetable, and are ranked among algæ. The organisms formerly known as Globe Animalcules (*Volvox*) are clusters of monads produced by gemmation from one monad and invested with a common envelope. Monads are of various colors. Their gemmation takes place according to fixed laws, so that the groups assume particular forms, characteristic of the different kinds. Thus, in the 'Breast-plate Animalcule'

(*Gonium pectorale*), so called from the form which the group frequently presents, a division takes place into four, and the number in a group is always either 4 or 16, a group of 16 always dividing into 4 parts, each of which contain 4 monads.—The minute moving points often seen under the microscope are probably not usually monads, but spores or germs.

MON'AD, in Philosophy: term borrowed from the peripatetic philosophy, though employed by moderns in a sense different from that of the Peripatetics (see ARISTOTLE), who used it to designate the universe as understood in the pantheistic sense. By moderns, especially by LEIBNITZ (q.v.), from whose system alone the term has derived importance, it is used to describe the primary elements of all matter. The monads, in this philosophical speculation, are simple uncompounded substances, without figure, without extension, without divisibility, by the aggregation of which all bodies are formed, and into which all compounded things may ultimately be resolved. The monads are created things, but as being uncompounded, are indestructible; and though subject to change, the change is only external or relative. They are of two classes—the first are destitute of consciousness, though possessing an internal activity called 'perception'; the second possess, in addition to perception, a certain consciousness, called 'apperception' or conscious-perception. The monads of this second class are souls, and according to the degree of their consciousness is the distinction between the souls of the higher and those of the lower intelligences. The Deity is the PRIME MONAD, or MONAD OF MONADS. The theory of monads enters largely into the philosophic system of Leibnitz, and indeed furnishes the key to much in that system which is otherwise obscure.

MONADELPHIA, n. *mŏn'ă-dĕl'fĭ-ă* [Gr. *monos*, alone; *adelphos*, a brother]: in bot., plants having hermaphrodite flowers, in which all the stamens are united into one bundle by union of their filaments, through which the pistil passes. MON'ADELPH, n. *-dĕlf*, one of the *monadelphia*. MON'ADEL'PHIAN, a. *-fĭ-ăn*, or MON'ADEL'PHOUS, a. *-fŭs*, pertaining to the monadelphia; having the stamens united into one bundle by union of their filaments.

MONAD'NOCK, GRAND: see GRAND MONADNOCK.

MONAGHAN, *mŏn'a-ċhan*: inland county of the province of Ulster, Ireland, between Tyrone on the n., Armagh and Louth on the e., Meath and Cavan on the s., and Fermanagh on the w. Its greatest length n. to s. is 37 m.; its greatest breadth, e. and w., 28; 500 sq. m., or 319,757 acres, of which 285,885 are arable. The general surface is undulatory, the hills, except in the n.w. and e., being of small elevation, though often abrupt; the highest point does not exceed 1,254 ft. above the sea. There are many little lakes, usually shallow; and though the

MONAGHAN—MONANDRIA.

streams are numerous, there is no navigable river. In geological structure the level country belongs to the great central limestone district; the rest is of the same transition formation as in the northern tract of Leinster. No minerals are found in remunerative quantity; there is a small coal-field in the s. border, not profitably worked. The soil is very varied in character, and mostly wet and imperfectly drained, though commonly capable of much improvement; but in general it is suitable for cereal crops (except wheat, which is little cultivated), and of flax. The total area under crops 1881 was 138,223 acres. There were 55,965 acres under oats, 15,687 acres under flax. The cattle 1881 numbered 70,282; sheep, 11,313; pigs, 19,965. Annual valuation of property 1880 was £264,969. M. is well supplied with good roads, and is connected by railway with Dublin, Belfast, and Galway, and directly with the coast at Dundalk. The Ulster canal passes through the county. Principal towns are Monaghan (q.v.), Carrickmacross, Clones, and Castle-Blarney.—M., at the invasion, formed part of the grant of Henry II. to De Courcey, and was partially occupied by him; but it speedily fell back into the hands of the native chiefs of the sept MacMahon, by whom (with some alterations of re-conquest) it was held till the reign of Elizabeth, when it was erected into a shire. Even still, however, the authority of the English was in many places little more than nominal, especially in the n.; and in the rising of 1641, the MacMahons resumed the territorial sovereignty. The historical antiquities of the county are of little interest or importance. The name is from Irish *Muinechan*, 'Monkstown,' a monastery having stood here at very early date. M. possesses two round towers, one complete, at Clones, the other at Inniskeen; and there are many remains of the ancient earthworks commonly referred to the ante-English period. Pop. (1891) 86,089; (1901) 74,611. Of the pop. 73 per cent. are Roman Catholics., 13 per cent. Episcopalians.

MONAGHAN: chief town of the Irish county M., on the great n. line from Dublin to Londonderry, 76 m. n.n.w. M., before the union, was a town of some importance, having a charter from James I., and returning two members to the Irish parliament. It is still the centre of active inland trade, has a monthly fair, and has some public buildings of considerable pretensions, among which are the jail, market-house, and court-house. A Pom. Cath. college and a cathedral dedicated to St. MacCarthain, also are notable. Pop. (1891) 2,938.

MONAMINE, n. *mōn'ā-mēn* [Gr. *monos*, alone; and *amine*, which see under **AMIDE**]: an amine into which only one molecule of the alcohol radical enters.

MONANDRIA, n. *mōn-ān'drī-ā* [Gr. *monos*, alone; *aner* or *andra*, a man]: in *bot.*, a class of plants which have only one stamen. **MONAN'DRIAN**, a. *-drī-ān*, or **MONAN'DROUS**, a. *-drūs*, having one stamen only. **MONAN'DRY**, n. marriage to one husband only; opposed to polyandry.

MONARCH—MONARCHIANISM.

MONARCH, n. *mön'ârke* [Gr. *monarchos*, one who reigns alone, a monarch—from *monos*, alone; *archein*, to rule: F. *monarque*: It. *monarca*]: the prince or ruler of a country; a king; a sovereign; a potentate; a person or thing superior to others of the same kind: **ADJ.** supreme; ruling. **MONARCHAL**, a. *mön-âr'käl*, regal; pertaining to or suitable to a monarch. **MONAR'CHIC**, a. *-kîk*, or **MONAR'CHICAL**, a. *-kî-käl*, of or relating to a monarchy; vested in a single ruler. **MONAR'CHICALLY**, ad. *-lî*. **MONAR-CHIZE**, v. *mön'é-ér-kîz*, to rule over as a monarch; to play the monarch. **MON'ARCHIZING**, imp. **MON'ARCHIZED** pp. *-kîzd*. **MON'ARCHISM**, n. *-kîzm*, principles or state of monarchy. **MON'ARCHIST**, n. *-kîst*, an advocate of monarchy. **MON'ARCHY**, n. *-kî* [F. *monarchie*, a monarchy—from Gr. *monar'chiă*, a kingdom]: state or government in which the supreme power is vested in a single person, being either limited or absolute; a kingdom; an empire: see below.

MONAR'CHIANISM: doctrinal conception by a party in the early church (about 180–320) relative to the nature of Jesus Christ; which, while retaining his office as the Divine and only Redcemer of sinful man, refused to admit more than one person in the Deity. The history of this party is obscure; and there were several groups with varying opinions, which are brought to our knowledge mostly through the representations of their adversaries. M. has often been divided into: 1. Dynamic M., holding that Christ was not pre-existent in God, but was a man fully endowed with divinity by direct communication from God—i.e., that he was empowered as God; 2. Modalistic M., holding that Christ was so absolutely God and One with the Father, that he was not a divine distinct person, but the mode of manifestation of the single absolute divine essence. This division is not fully adequate as a classification of monarchian doctrines, though helpful. The monarchians were called also Patripassians (q.v.); and later, Sabellians (see **SABELLIUS**). See also **INCARNATION**: and references thereunder (also **ARIUS**)—showing subsequent historical developments of the monarchian tenets, and the resulting controversies.

MONARCHY—MONASTERY.

MON'ARCHY: form of government in a community by which one person exercises the sovereign authority. It is only when the king, or chief magistrate of the community, possesses the entire ruling power, that he is properly a monarch. Most of the oriental governments past and present, Russia at present, and Spain and France in the 18th c., are in this strict sense monarchies. The degenerate form of M. is tyranny, or government at the mere will and for the benefit of the ruler. When the head of the state, still possessing the status and dignity of royalty, shares the supreme power with a class of nobles, with a popular body, or with both, as in Britain, the government, though no longer in strictness monarchical, is called in popular language a mixed or limited M., the term absolute M. being applied to a government properly monarchical. The highest ideal of government would perhaps be attained by an absolute M., if there were any security for always possessing a thoroughly wise and good monarch; but this condition is obviously unattainable, and a bad despot is a measureless evil. It therefore becomes desirable that a governing class, composed, if possible, of the wisest and most enlightened in the country, should share the supreme power with the sovereign. A limited M. has this advantage over an aristocratic republic, that in difficult crises of the nation's existence royalty becomes a neutral and guiding power, raised above the accidents and struggles of political life.

M., usually hereditary, has sometimes been elective, a condition generally attended with feuds and distractions, as in Poland. The elective system is still followed in the choice of the pope. Constitutional M. may be in its origin elective, or combine both systems, as when one family is disinherited, and the sceptre declared hereditary in the hands of another under certain conditions. See **KING: REPUBLIC: GOVERNMENT: CONSTITUTION**, in **Politics**.

MONASTERY, n. *mön'äs-tër-ĭ* or *mön'äs-trĭ* [F. *monastère*—from Gr. *monastērĭōn*, a place where one may live in solitude—from *monos*, alone: It. *monastero*, a monastery: mid. L. *monastēriūm*, a minster]: a religious house for retirement; an abbey; a convent, for either monks or nuns, but more usually the former. **MONASTIC**, a. *mō-näs'tĭk*, or **MONAS'TICAL**, a. *-tĭ-kāl*, pertaining to monks or to monasteries; secluded from the world; devoted to religion. **MONAS'TICALLY**, ad. *-lĭ*. **MONAS'TIC**, n. *-tĭk*, a monk. **MONAS'TICISM**, n. *-tĭ-sĭzm*, monastic life (see **MONACHISM**). **MONAS'TICON**, n. *-tĭ-kōn*, a book on monasteries.—**SYN.** of 'monastery': priory; abbey; cloister; convent.

MON'ASTERY: generic name of the residence of any body of men, or more rarely, of women, bound by monastic vows: see **MONACHISM**. In the Western Church—here had in view—there were various classes of monastic establishments. The name, in its most strict acceptance, is confined to the residences of monks, properly **sq**

MONASTIR.

called, or of nuns of the cognate orders (as the Benedictine), and as such, it comprises two great classes, the *Abbey* and the *Priory*. The name Abbey was given only to establishments of the highest rank, governed by an abbot, who was commonly assisted by a prior, sub-prior, and other minor functionaries. An abbey always included a church, and the English word *Minster*, though like the cognate German *Münster* it has now lost its specific application, had its origin in the Latin *monasterium*. A *Priory* supposed a less extensive and less numerous community. It was governed by a prior, and was originally, though not uniformly, at least in later times, subject to the jurisdiction of an abbey. Many priories possessed extensive territorial domains, and of these, not a few became entirely independent. The distinction of abbey and priory is found equally among the Benedictine nuns. In the military orders, the names *Commandery* and *Preceptory* corresponded with those of abbey and priory in the monastic orders. The establishments of the Mendicant, and, in general, of the modern orders, are sometimes, though less properly, called monasteries. Their more characteristic appellation is *Friary* or *Convent*, and they are commonly distinguished into *Professed Houses* (called also *Residences*), *Novitiates*, and *Colleges*, or *Scholastic Houses*. The names of the superiors of such houses differ in the different orders. The common name is *Rector*, but in some orders the superior is called *Guardian* (as in the Franciscan), or *Master*, *Major*, *Father Superior*, etc. The houses of women—except in the Benedictine or Cistercian orders—are called indifferently *Convent* and *Nunnery*, the head of which is styled *Mother Superior*, or *Reverend Mother*. The name *Cloister* properly means the inclosure; but it is popularly used to designate, sometimes the arcaded ambulatory which runs around the inner court of the building; and sometimes in the more general sense of the entire building, when it may be considered synonymous with *Convent*.

MONASTIR': seaport town of n. Africa, dominion of Tunis, on the gulf of Sidra, 80 m. s.s.e. of the city of Tunis. Woolen and camlet fabrics are manufactured, and there is some maritime trade. Pop. 12,000.

MONASTIR, *mō-nās-tēr'*, TOLI-MONASTIR, or BITOLIA: town of European Turkey, cap. of the vilayet of M.; in a broad valley of the Niji Mountains, 90 m. n.n.e. of Janina, and about the same distance w.n.w. of Saloniki. It is an important place, is the residence of the gov.gen., and commands the routes between Macedonia and n. Albania. The inhabitants are mostly Greeks and Bulgarians. M. has 11 mosques. There is large trade with Constantinople, Saloniki, Vienna, and Trieste: from Constantinople alone it annually buys goods to the value of \$7,500,000. Its bazaars contain more than 2,200 shops. In 1903, May, the town was the scene of rioting and massacre, in which a considerable number of Bulgarians were killed before the Turkish troops were able to suppress the outbreak.

MONBODDO, *mön-böd'ō*, JAMES BURNET, Lord: Scottish lawyer and author: 1714–1799, May 26; b. Monboddo, in Kincardineshire. He was educated at Marischal College, Aberdeen, where he showed fondness for the Greek philosophers; and afterward studied law three years at Groningen, Holland. In 1737, he became a member of the Scottish bar, and soon obtained considerable practice. In 1767, he was raised to the bench, as Lord Monboddo. M.'s first work, on the *Origin and Progress of Language* (1771–76), is very learned, heretical, and eccentric; yet in the midst of its grotesque crotchets there occasionally flashes out a wonderfully acute observation, that makes one regret the distorted and misapplied talent of the author. In the present day the notion that men have sprung from monkeys, is perhaps that most associated with the name of M., who gravely asserted that the orang-outangs are members of the human species, and that in the Bay of Bengal there exists a nation of human creatures with tails, and that men generally have only worn away theirs by sitting on them, but that the stumps may still be felt. M. wrote also *Ancient Metaphysics*, 6 vols. (1779–99).

MONCADA, *mön-kâ'thâ*, Don FRANCISCO DE, Conde de Osona: historian, and one of the Spanish classics: 1586, Dec. 29—1635; b. Valencia, where his grandfather was then viceroy. Descended from one of the greatest families of Catalonia, he rapidly rose to the highest offices in the state, was ambassador to Vienna, and latterly gov. of the Netherlands, and commander-in-chief of the Spanish troops there. He fell at the siege of Goch, a fortress in the duchy of Cleves. His *Historia de la Expedicion de Catalones y Aragoneses contra Turcos y Griegos* (Barcelona 1623, frequently reprinted), is a masterpiece in liveliness and elegance of style.

MONCALIERI, *mön-kâ-lē-ā'rē*: town of Italy, province of Turin, situated finely on the slope of a hill, on the right bank of the Po, five m. above Turin. M. is the first railway station between Turin and Genoa, and communicates daily with Turin by frequent omnibuses; it has fine buildings, including a palace lately embellished for the residence of King Victor Emmanuel. The annual cattle-fair at M., in Oct., is the most important in n. Italy. Pop. 3,030.

MÖNCHEN-GLADBACH: see GLADBACH.

MONCTON, *münk'ton*: town in Westmoreland co., New Brunswick, Canada; about 89 m. n.e. of St. John. It is a port of entry, at the head of navigation on the Petitcodiac river; its exports (1881–2) amounting to \$64,817, imports \$252,571. It is on the Intercolonial r.r., and is the seat of its general offices and workshops, besides having iron and brass foundries, sugar refineries, factories for cotton goods, tobacco, leather, steam-engines, machinery, and wooden-ware. It has several branch banks, good hotels, several newspapers, and churches. Pop. (1871) 4,810; (1881) 5,032; (1891) 8,765; (1901) 9,026.

MONDAY—MONETARY.

MONDAY, n. *mũn'dā* [AS. *monandæg*, the day sacred to the moon—from *mona*, the moon; *dæg*, a day]: the second day of the week. The name is a translation of the Roman name *Lunæ Dies* (Day of the Moon)—following the Roman custom in naming the days of the week after the planets.

MONDE, n. *mõngd* [F. world]: a number or circle of people who know and visit each other; the world; society. **BEAU-MONDE**, n. *bō-mõngd'* [F.]: the fashionable world. **DEMI-MONDE**, *dẽm'ĩ-* [F. *demi*, half]: a name given to the so-called higher class of prostitutes in every large town and city.

MONDOVI, *mõn'dō-vē*: town in Cuneo, one of the provinces of n. Italy, on the shoulder of a hill 50 m. s. of Turin. It is divided into four sections: the Piazza and three suburbs. There are manufactures of cloth and silk. The Piazza contains a fine cathedral, with rich paintings; an episcopal palace, with a noble gallery of portraits; and the various judicial and educational halls. At the battle of M., 1796, Apr. 22, the Sardinians were totally defeated by Bonaparte.—Pop. of M. (1881) 9,637.

MONEMBRYONY, n. *mõn'ẽm-brĩ'ō-nĩ* [Gr. *monos*, one; *embruon*, an embryo]: in *bot.*, the production of one embryo only. **MONEMBRYON'IC**, a. *-brĩ-õn'ik*, having a single embryo.

MONERA, n. plu. *mõn-ẽ'ră* [Gr. *monērēs*, solitary]: class of Protozoa (q.v.) proposed by Haeckel to include the very lowest organisms known—mere masses of undifferentiated protoplasm, resembling *Amœba* (see **PROTEUS**), but unprovided with a nucleus. The M. present specific and even generic distinctions. *Protamœba* and *Proto-myxa* are examples of M. The glairy mud found among the calcareous sediment that covers great part of the bed of the n. Atlantic was formerly referred to the M., and called *Bathybius*, but Prof. Huxley, who conferred the name, now denies its organic nature: see **BATHYBIUS**.

MONESIA BARK, *mo-nē'sĩ-a*: bark of a tree (*Chrysophyllum glycyphlœum* or *C. Buranheim*), of the same genus with the Star Apple (q.v.), native of s. Brazil. The bark is lactescent; but when dried, it is thick, flat, compact, heavy, brown, and hard, with a taste at first sweet, afterward astringent and bitter. A substance called *Monesia* is extracted from it, which is almost black, at first sweet, then astringent, finally acrid: it is used as a stomachic and alterative in leucorrhœa, chronic diarrhœa, etc. It contains, in small quantity, a principle called *Monesin*.

MONETARY: see under **MONEY**.

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MONEY, n. *mŭn'iz* [OF. *monnaie*; F. *monnaie*, money—from L. *monēta*, a surname of Juno, in whose temple at Rome money was coined; the mint: It. *moneta* (see **MINT**, note)]: coin in gold, silver, or copper; stamped metallic pieces, being the legalized currency of a country; anything which passes as a money equivalent, in commercial dealings, e.g., bank-notes (see **MONEY**, below): wealth; affluence. **MONEYS**, n. plu. *mŭn'iz*, the various sums included in one total; different sums of money. **MONEYED**, or **MONIED**, a. *mŭn'id*—the former preferable—rich in money; consisting in money. **MONEYERS**, n. plu. *mŭn'iz-erz*, officers of the royal mint who superintend the coining of money; the men employed in the making of coins for money. **MON' EYLESS**, a. *-lēs*, destitute of money. **MONETARY**, a. *mŭn'ē-tēr-ī*, relating to money or moneyed affairs. **MONETIZE**, v. *mŭn'ēt-īz* [L. *moneta*, money]: to give a standard value to, in the coinage of a country; to form into coin. **MONEY BILL**, in *Brit. parliament*, bill or measure before the house of commons for the raising or granting of money for the use of government. **MONEY-CHANGER**, one who deals in money or exchanges. **MONEY-LENDER**, one who lends money on interest. **MONEY-MAKING**, acquiring or gaining wealth. **MONEY MARKET**, general term for the course or the state of transactions in money, in discounts, loans, and payments, in such places as Lombard Street, London, Wall Street, New York, the Stock Exchange, the Bank of England, and other banks. **MONEY MATTERS**, affairs about money. **MONEY ORDER**, an order, payable at sight, granted by a post-office for any small sum of money, and made payable at certain post-offices—granted on depositing the sum named and the payment of a small commission. **MONEY-SCRIVENER**, person who procures the loan of money for others. **MONEY'S WORTH**, full value.—**MONETARY COMMISSION** of the U. S. congress, 1876,7: **MONETARY CONFERENCE** (International), Paris 1878: **MONETARY TREATY OF PARIS**, 1865 (in the *Latin Monetary Union*):—see **MONEY**, below.—**SYN.** of 'money': coins; cash; specie.

MON' EY, in Political Economy: term differently defined, according to the theories of different writers: well defined, by a leading American economist (Francis A. Walker, *Money, Trade, and Industry*), as 'that which passes freely from hand to hand, throughout the community, in final discharge of debts and full payment for commodities, being accepted equally without reference to the character or credit of the person who offers it, and without the intention of the person who receives it to consume it or enjoy it or apply it to any other use than in turn to tender it to others, in discharge of debts or payment for commodities.' For consideration of M. in a special department of its use, see **BANK—BANKING: CURRENCY**. It is scarcely possible to frame a definition of M. at once accurate, and comprehensive enough to include every instance of its use or function. A few distinctions are here indicated, which may tend to obviate

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confusion in the comprehensive use of the term as an element in economic science.

M. is often spoken of loosely as the same thing with capital; but they are different. Before anything is M., it must be such that its possessor can go into the market and immediately use it in purchasing commodities or paying debts. The plant of a railway and the machinery of a mill, so long as they are in full use, are capital, and are capital which probably has once been M.—but they are M. no longer, because they cannot be used in making payments, though they have perhaps become more valuable than ever they were. The confusion of capital with M. was the mistake made in issuing the French assignats on the security of the forfeited landed estates. Each assignat was a promise to pay; but when payment was demanded, it could not be made, because land was not a medium for making it. It is of the essence of M., then, that it is capable of making immediate payment either to satisfy a seller or a creditor. But an article may be M. though it will not satisfy everybody; and articles available as M.—even those nearest to universal acceptance as such—are available for other purposes. What we are familiar with as the most approved form of M.—as the thing that will be most certainly received in payment all over the world—is coin of the precious metals. The reason why the claim of these is so universally accepted is, that they do not merely *represent* value, as we shall find other kinds of M. do, but they really *are* value. If the dealer sells a hat for a sovereign, he knows that the sovereign does not depend, like a pound-note, on the solvency of the issuer, but that it has got value put into it by costing about as much labor and skill in bringing it into existence as the hat which he gives for it. But even all coins perfectly available for M. are not of the intrinsic value of their denomination. The silver for making 20 shillings sterling is of considerably less value as a commodity than the gold in a sovereign; and in the same way, 240 pence, which are as M. equal to a sovereign, are equal to only a percentage of it in value as merchandise. The convenience of their use for small transactions makes up for depreciation in value of coins of the inferior metals, when gold is a standard; and to prevent incidental abuses, the law limits the extent to which they are a legal tender as good money.

Money transactions are distinguished from barter, in which one commodity is transferred for another, as where the shepherd, in primitive times, may be supposed to have given the agriculturist a sheep for a measure of corn. This distinction is extremely useful, since the invention of a circulating medium, which supersedes the narrow and cumbrous process of barter, by facilitating transactions of every variety of importance among all sorts of people, is a grand type of advance in civilization. Like many other distinctions, however, it has not an absolute line of demarkation. The precious metals hold their value by their being commodities as well as being M.,

and coins are frequently melted for plate and jewelry. Where M. is available within only one narrow region, its use verges on barter. In central Africa, purchases are made and debts paid by strings of beads or coils of brass wire. An ivory merchant or a traveller will lay in a stock of these, just as in America or Europe he would carry gold or circular notes. They are commodities, being used as ornaments by the inhabitants. But they are distributed to an extent far beyond the demand in this shape; and that they absolutely constitute M. is shown by this peculiarity in the case of beads, that a particular color will pass current, and another will not; so that the merchant who chooses the wrong kind, though he have full value in merchandise, has not taken with him a supply of available cash.

The precious metals are an expensive form of M., which there is a temptation to supersede by paper-M.: for the reason of this, see BULLION. For the various opinions adopted by different classes of economists on paper-M., and for the devices to meet the great difficulty of rendering this kind of M. secure and equal in value to bullion, see CURRENCY. Paper-M., or M., founded on credit—one of the resources of advanced civilization and complicated commerce—introduces a class of moneys so extensive and various, that it is impossible to mark the limits of its extent, or enumerate the shapes that it may take. An attempt has been made to get riddance of all difficulties by saying that a promise to pay is only the representative of M. But if it serve the purpose of buying or paying debt, it really is M. No one hesitates in counting a \$5 bank-note, on a bank known to be sound, as M. But a check by a person known to have a balance or credit at a solvent bank is equally M.; and though it is an order to pay, no actual bullion need ever be given for it, for the payment may be in notes, or the holder may hand it over to his own banker, in whose accounts it will be credited to the holder, and debited against the banker on whom it is drawn. The special difficulty as to paper-M. is, that it may be mistaken for M. when it is none, as in the case of a check not honored by payment; or, that it may be of less intrinsic value than it professes to be, as when there is what is called an over-issue (see CURRENCY). There are thus great risks attached to the use of paper-M.; but there are risks specially applicable also to bullion-M., e.g., light weight, base coin, and the absence of those facilities for detection in theft or fraud which are among the advantages of paper-M. The special risks attending the use of paper have been shown in practice to be so capable of remedy by legislative precautions, that at present, in Scotland, one-pound notes are taken with less suspicion than gold sovereigns. On transactions in general, the chance of loss from forgery or insolvency is deemed less than the chances from light weight, even if the risk of base coinage should not come into consideration.

Making allowance for coins sent abroad or used as

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metal, the M. of Britain is calculated as follows: gold, seventy-five million pounds; silver and copper, thirteen million pounds; and notes, forty-two million pounds—in all, one hundred and thirty million pounds. But so large is the extent of paper-M., in the shape of drafts and bills, that of these payments, to the extent of more than two thousand million pounds in a year are settled at the London clearing-houses, or the establishments where the London banks, and those dealing with them, clear off their mutual obligations by paying over the balances.

Money in the United States.—The earliest known mediums of barter and exchange among the aborigines and the first European settlers were wampum, bits of dried cod-fish, pieces of lignite, coal, bone, shell, mica, pearl, and carnelian, and various native metals cut or hammered into different sizes and shapes. In the Atlantic colonies, wampum predominated for many years, was recognized as legal tender, and, though made without material cost or difficulty by the Indians, was frequently counterfeited. Musket-balls were rated at a farthing apiece, and were legal tender for sums under one shilling. Pieces of shells—black, from the back of the clam shell, and the most valuable, and white, from the periwinkle—were used singly, in various quantities, in strings, in bunches of strings, and in belts. Corn and beans, too, were in vogue in Mass., and wampum and beaver skins were the chief mediums in the New Netherlands. The legal-tender wampum of New England consisted of a belt 6 ft. long, containing 360 beads, valued at 12*d*. Ordinarily 3 black and 6 white beads were current for 1*d*. A belt of wholly white beads was valued at one-half of one wholly black. The demand for beads for purposes of trade soon became so large, and the little bits were so highly prized by the Indians, that the whites were led to inflate the currency to the disadvantage of the natives by importing beads from Europe by the barrel. Corn was made legal tender in Plymouth colony 1641. The first coined metal came into Mass. through the W. Indies trade about 1650, and consisted of gold and silver coined in Spain. Two years afterward a mint was established in Boston, and for several years shillings, sixpences, and threepences were coined from silver. The native metal tokens of gold, silver, lead, copper, and iron were fashioned by the Indians in the Mississippi region, and for many years were used almost exclusively in barter with the French in Canada. The production of silver coin by the Boston mint proved inadequate for the growing trade of the colony, and tax collectors were authorized to receive cattle (when not lank), corn, furs, and lumber, where coined money could not be obtained. In 1675 it was ordered in Mass. that paper orders should be used in transferring tax receipts to and from the treasury, instead of the various mediums of barter. This led to the establishment of a bank of issue 1686, which soon afterward suspended; and 1688 the coinage of silver ceased.

The first paper-M. was issued by authority of the Mass.

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colony 1690, in order to pay the troops engaged in the expedition against the French in Canada, and was receivable for taxes. Paper-M. was maintained at par for 20 years by the treasury being authorized 1692 to allow a premium of 5 per cent. over coin on all bills paid into it. After the joint colonial expedition to Canada 1709-11, several banks were established to issue paper currency on various securities. The amount of paper notes thus put into circulation so alarmed the colonists that 1720 the commissioners of the New England colonies recommended that further issues should be stopped. Parliament was induced to forbid banking excepting under its direct charter, and to prohibit the emission of paper currency by colonial govts. In 1751 legal tender for paper-M. in the colonies was abolished by parliament, and as several colonies refused to heed the law, that body declared any such issue void 1763. Mass. was enabled to retire all her paper-M. with her share in English specie of the ransom allowed by parliament for the capture of Louisburg by the New England colonies 1745, and was out of debt 1774. Penn. authorized the issue 1723 of £15,000 in colonial paper-M., to be apportioned among the counties and loaned by their commissioners for 16 years at 5 per cent. interest, with $\frac{1}{16}$ of the principal repaid annually. In 1739 the amount of such M. outstanding was £80,000, and in that year a bank was established in Philadelphia, which loaned notes at 3 per cent. interest, and 5 per cent. in principal per annum, both payable in merchandise. In 1740 parliament ordered this bank to stop operations, but by social and political arrangements it evaded the law.

The first joint issue of paper-M., or bills of credit, by the colonies for the prosecution of the revolutionary war, was authorized 1775, May 10, and was for \$300,000, payable in 3 years, for which the faith of the colonies severally was pledged. The congress, colonies, and states passed stringent legal-tender acts, and congress did not even recommend the levy of taxes till 1777, Jan. 14. Subsequently large sums were called for by congress—\$5,000,000 for 1777, and \$186,000,000 for 1779-80; but the actual amount received was comparatively small. In 1781 all the states, headed by Penn., on the recommendation of congress, repealed their legal-tender acts. The total amount of continental M. issued during the war has been variously stated, but it was reported by Joseph Nourse, register of the treasury 1828, Jan. 30, at \$241,552,780. This was in addition to an aggregate of about \$209,524,776 issued independently by the colonies. In 1780 Peletiah Webster, a financial writer of Philadelphia, estimated the total amount of specie in the colonies at from \$10,000,000 to \$12,000,000. In 1781, Dec. 31, congress chartered the Bank of North America, in Philadelphia, which began business with a cap. of \$400,000 and a govt. subscription of \$254,000, in the form of cash deposits. The Penn. legislature repealed the bank's local charter 1785, but it continued operations under the charter of

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congress, and subsequently had its local charter renewed. Similar banks were chartered in N. Y., Mass., and Md., although the federal constitution (1787) expressly declared that no state should coin M., emit bills of credit, or make anything but gold or silver coin a tender in payment of debts. Congress authorized the establishment of a mint 1792, the year after it had established the first bank of the United States, and sanctioned the use of foreign coins for three years, when it was supposed the new national coins would be ready for circulation. During the war with Great Britain 1812-15, the U. S. govt. issued \$17,000,000 in treasury notes in three instalments, each for one year and at $5\frac{1}{2}$ per cent. interest; but while these were not legal tenders, they were received in payment of duties on imports and other taxes due the govt.; and although in ill-repute in 1814, sold at par 1815. The charter of the first bank of the United States expired 1811, and congress 1816 chartered a second one, which remained in existence till 1836. Almost the entire volume of paper-M. in circulation in the United States 1789-1863 was furnished by local state banks, the exceptions being the two U. S. banks, the several issues of treasury notes, and banks in the D. C. In 1863 the national banking system was established. By that time congress had authorized the issue of \$450,000,000 in treasury notes, of which \$400,619,206 had been issued, besides compound interest and 7-30 notes, on account of the civil war. The principal of the national debt 1863, July 1, was \$1,119,772,138, and it reached its highest point 1866, July 1, when it aggregated \$2,773,236,173. 1890, Jan. 1, it had been reduced to \$1,617,372,419. See DEBT, NATIONAL.

The outstanding currency of the United States and of the national banks 1889, Nov. 1, was: U. S. issues: legal-tender notes \$346,681,016; old demand notes \$56,442; and fractional currency (most of which has been worn out or lost, or is held as a curiosity) \$15,291,624; notes of national banks, including gold notes, \$201,925,826; total \$563,954,908. There were then 3,170 national banks, with \$596,302,518 cap. and \$194,818,192 surplus; and 849 savings banks, with \$1,444,391,325 deposits, \$127,225,533 surplus, \$19,845,228 undivided profits, and \$31,150,129 of other liabilities. The total M. of the United States 1889, July 1, was estimated: metallic \$1,100,612,434, paper \$991,989,719; and was distributed according to the report of the director of the mint as follows: in U. S. treasury: metallic: gold bullion \$65,995,145, silver bullion \$10,444,443, gold coin \$237,586,792, silver dollars \$279,045,351, subsidiary silver coin \$25,124,672, total metallic \$618,196,403; paper: legal-tender notes (including \$16,955,000 held for redemption of certificates of deposit for legal-tender notes) \$47,196,825, certificates of deposit \$240,000, gold certificates \$36,918,323, silver certificates \$5,474,181, national bank notes \$4,158,330, total paper \$93,987,659; in national banks: metallic: gold coin (including \$8,744,000 clearing-house gold certificates) \$82,651,610, silver dollars \$6,786,730, subsidiary silver coin \$4,495,681,

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total metallic \$93,934,021; paper: legal-tender notes \$97,456,832, certificates of deposit \$16,955,000, gold certificates \$69,517,790, silver certificates \$12,452,057, national bank notes (including \$2,954,100 of their own notes held by the different national banks) \$27,715,587, total paper \$224,097,266; and in circulation: metallic: gold coin \$293,829,958, silver dollars \$47,670,569, subsidiary silver coin \$46,981,483, total metallic \$388,482,010; paper: legal-tender notes \$202,027,359, old demand notes \$56,442, gold certificates \$47,612,432, silver certificates \$244,703,508, national bank notes \$179,505,046, total paper \$673,904,794. The gold and silver coin in the United States 1889, July 1, aggregated: gold \$614,068,360, silver dollars \$333,502,650, subsidiary \$76,601,836, total silver \$410,104,486, total gold and silver \$1,024,172,846.

The world's production of gold bullion 1851-85 was about \$4,325,400,000 in value, and silver bullion \$2,332,800,000; 1888, gold \$105,994,150, silver \$142,437,150; U. S. production 1888, gold \$33,175,000, silver \$59,195,000. Australasia was next to the United States in gold, \$27,327,600, and Mexico in silver, \$41,373,000.

The unit of value in the United States was first fixed by congress 1785 as the silver dollar; and in the act providing for the mint 1792 the dollar intended was described as one having the value of the Spanish milled dollar then current. The same act specified that this dollar should contain $371\frac{1}{4}$ grains of pure silver, and that the gold eagle should contain $247\frac{5}{16}$ grains, or $24\frac{7}{10}$ grains to the single gold dollar. In 1834 the weight of the gold eagle was reduced to 232 grains, but the silver dollar was not disturbed; 1837 a change was made in the composition of both coins, but the silver dollar retained its former quantity of pure silver, while the pure gold in the eagle was increased to $232\frac{2}{10}$ grains, making the legal equivalency of gold to silver, by weight, 15.988 of silver to 1 of gold; 1853 the proportion of pure silver in coins smaller than the dollar was reduced, and the legal-tender limit of these coins was fixed at 5 dollars; 1873 silver was demonetized, and the one-dollar gold piece of 25.8 grains was made the unit of value; and 1878 the standard silver dollar was remonetized, according to the weight, fineness, devices, and superscriptions required in the act of 1837.

In 1900 congress passed a new currency act. in which the gold dollar was made the unit of value. The principal of the national debt, 1903, June 30, was \$2,202,464,781; the outstanding currency of the United States and of the national banks was \$1,592,908,418; and the general stock of money in the United States was \$2,688,961,878. or \$29.64 per capita. In 1901 the United States led all the countries of the world in the production of gold (\$78,666,700), with Australasia second (\$76,890,200), and was second in silver (\$71,387,800 coining value), with Mexico first (\$74,545,900. The sec. of the U. S. treasury, 1899, Jan. 1, officially proclaimed the following values of for. coins in U. S. Money:

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VALUE OF FOREIGN COINS IN UNITED STATES MONEY.

COUNTRY.	Standard.	Monetary Unit.	Value in U. S. Money.	Coins.
Argentine Republic....	Double.....	Peso.....	\$0.96,5	Gold: argentine (\$4.82,4) and 1-2 argentine. Silver: peso and divisions.
Austria.....	Single silver.....	Florin.....	.33,6	Gold: 4 florins (\$1.92,9), 8 florins(\$3.85,8), ducat(\$2.28,7), and 4 ducats (\$9.15,8). Silver: 1 and 2 florins.
Belgium.....	Double.....	Franc.....	.19,3	Gold: 10 and 20 francs. Silver: 5 francs.
Bolivia.....	Single silver.....	Boliviano.....	.68	Silver: Boliviano and divisions.
Brazil.....	Single gold.....	Milreis of 1,000 reis.....	.54,6	Gold: 5, 10, and 20 milreis. Silver: 1-2, 1, and 2 milreis.
British North America.	Single gold.....	Dollar.....	1.00	
Chili.....	Double.....	Peso.....	.91,2	Gold: escudo (\$1.82,4), doubloon (\$4.56,1), and condor (\$9.12,3). Silver: peso and divisions.
Cuba.....	Double.....	Peso.....	.92,6	Gold: doubloon (\$5.01,7). Silver: peso.
Denmark.....	Single gold.....	Crown.....	.26,8	Gold: 10 and 20 crowns.
Ecuador.....	Single silver.....	Suere.....	.68	Gold: condor (\$9.64,7) and double condor. Silver: sucre and divisions.
Egypt.....	Single gold.....	Pound (100 piastres).....	4.94,3	Gold: pound (100 piastres, 50 piastres, 20 piastres, 10 piastres, and 5 piastres). Silver: 1, 2, 5, 10, and 20 piastres.
France.....	Double.....	Franc.....	.19,3	Gold: 5, 10, 20, 50, and 100 francs. Silver: 5 francs.
German Empire.....	Single gold.....	Mark.....	.23,8	Gold: 5, 10, and 20 marks.
Great Britain.....	Single gold.....	Pound sterling.....	4.86,6 1-2	Gold: sovereign (pound sterling) and 1-2 sovereign.
Greece.....	Double.....	Drachma.....	.19,3	Gold: 5, 10, 20, 50, and 100 drachmas. Silver: 5 drachmas.
Guatemala.....	Single silver.....	Peso.....	.68	Silver: peso and divisions.
Haiti.....	Double.....	Gourde.....	.96,5	Silver: gourde.
Honduras.....	Single silver.....	Peso.....	.68	Silver: divisions of peso.
India.....	Single silver.....	Rupee of 16 annas.....	.32,3	Gold: mohur (\$7.10,5). Silver: rupee and divisions.
Italy.....	Double.....	Lira.....	.19,3	Gold: 5, 10, 20, 50, and 100 liras. Silver: 5 liras.

VALUE OF FOREIGN COINS IN UNITED STATES MONEY.—Continued.

COUNTRY.	Standard.	Monetary Unit.	Value in U. S. Money.	Coins.
Japan	Double.....	Yen { Gold.....	.99,7	Gold: 1, 2, 5, 10, and 20 yen.
Liberia.....	Single gold.....	Silver.....	.73,4	Silver: yen.
Mexico.....	Single silver.....	Dollar.....	1.00	Gold: dollar (\$0.98,3), 2 1-2, 5, 10, and 20 dollars. Silver: dollar (or peso) and divisions.
Netherlands.....	Double.....	Dollar.....	.73,9	Gold: 10 florins. Silver: 1-2, 1, and 2 1-2 florins.
Nicaragua	Single silver.....	Florin.....	.40,2	Silver: peso and divisions.
Norway.....	Single gold.....	Peso.....	.68	Gold: 10 and 20 crowns.
Peru	Single silver.....	Crown26,8	Silver: sol and divisions.
Portugal	Single gold.....	Sol.....	.68	Gold: 1, 2, 5, and 10 milreis.
Russia	Single silver.....	Milreis of 1,000 reis.....	1.08	Gold: imperial (\$7.71,8) and 1-2 imperial (\$3.86,0).
		Rouble of 100 kopecks.....	.54,4	Silver: 1-4, 1-2, and 1 rouble.
Spain.....	Double.....	Peseta of 100 centimes.....	.19,3	Gold: 25 pesetas. Silver: 5 pesetas.
Sweden	Single gold.....	Crown.....	.26,8	Gold: 10 and 20 crowns.
Switzerland.....	Double.....	Franc.....	.19,3	Gold: 5, 10, 20, 50, and 100 francs. Silver: 5 francs.
Tripoli.....	Single silver.....	Mahbub of 20 piastres.....	.61,4	
Turkey.....	Single gold.....	Piastre04,4	Gold: 25, 50, 100, 250, and 500 piastres.
U. S. Colombia.....	Single silver.....	Peso.....	.68	Gold: condor (\$9.64,7) and double-condor. Silver: peso.
Venezuela.....	Single silver.....	Bolivar.....	.13,6	Gold: 5, 10, 20, 50, and 100 bolivars. Silver: 5 bolivars.

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Monetary Commission of the U. S. Congress.—This commission, authorized by act 1876, Aug. 15, and comprising Senators John P. Jones, Lewis V. Bogy, and George S. Boutwell, Representatives George Willard, Richard P. Bland, and Randall L. Gibson, and experts William S. Groesbeck and Francis Bowen, was instructed to inquire: 1. Into the change which has taken place in the relative value of gold and silver; the causes thereof; whether permanent or otherwise; the effects thereof on trade, commerce, finance, and the productive interests of the country, and on the standard of value in this and other countries; 2. Into the policy of the restoration of the double standard in this country; and if restored, what the legal relation between the two coins, silver and gold, should be; 3. Into the policy of continuing legal-tender notes concurrently with the metallic standards, and the effects thereof upon the labor, industries, and wealth of the country; and 4. Into the best means for providing for facilitating the resumption of specie payments. The commission consulted with representative financiers and monetary authorities in the United States and Europe, and submitted 3 reports 1877, Mar. 2, a majority signed by Messrs. Jones, Bogy, Willard, Bland, and Groesbeck, a minority by Senator Boutwell, and a minority by Prof. Bowen. The majority report, answering the first inquiry, held that the variations in the relative values of gold and silver were due: 1. To the demonetization law of Germany 1871, similar laws of the United States 1873, 4, and that of the Scandinavian Union 1874; the limitation of the coinage of silver in France, Belgium, Switzerland, and Italy 1874; the suspension of silver coinage in Holland and Switzerland 1875, and in France 1876; and the proposals of the Spanish and Dutch govts. to demonetize silver; 2. To a temporary interruption in the demand for silver in the e.; 3. To the increase in the production of silver from the discovery of new mines in the United States, and the exaggerated reports of the extent of these discoveries, together with the general ignorance of the fact that nearly half of the products of the Comstock lode consists of gold; 4. To the demand in Germany for gold to replace bank notes, recalled to the amount of \$130,000,000; and 5. To the act of the U. S. congress 1875, ordaining the resumption of payments in gold in the beginning of 1879. The commission recommended the restoration of the double standard and the unrestricted coinage of both metals; Messrs. Jones, Willard, and Bogy advised the relative valuation of the Latin Union of 115½, as tending to strengthen those countries in the bimetallic position; while Messrs. Groesbeck and Bland favored the retention of the former legal relation of 15.988. The commission believed that the remonetization of silver by the United States would deter the Latin Union from abandoning the double standard, and, even if it should not, that it would restore its former value to silver. Senator Boutwell's minority report recommended that the U. S. govt. invite govts. of the other commer-

cial nations to join in a convention for the use of both metals for a currency, according to a fixed relative valuation to be agreed on, and deprecated independent action. Prof. Bowen's minority report, in which Mr. Gibson concurred, advised the adoption of a simple gold standard changing the weight of the coins, so that the American half-eagle would almost exactly equal in value the English sovereign, and vary but little from the French and German units of value.

International Monetary Conference.—This conference was held in Paris 1878, Aug., under the authority of an act of the U. S. congress (amendment to the bill entitled, 'An act to authorize the coinage of the standard silver dollar and to restore its legal-tender character,' adopted by both branches of congress, vetoed by the pres., and passed over his veto 1878, Feb. 28). The amendment directed the pres., on the passage of the act, to invite the govts. of the countries composing the Latin Union, and of such other European nations as he might deem advisable, to join the United States in a conference to adopt a common ratio of legal tender as between gold and silver, for the purpose of establishing, internationally, the use of bimetallic M., and securing fixity of relative value between those metals. Reuben E. Fenton, William S. Groesbeck, Francis A. Walker, and S. Dana Horton were appointed representatives of the United States. The invitation was accepted by the govts. of Austria-Hungary, Belgium, France, Great Britain, Greece, Italy, the Netherlands, Russia, Sweden and Norway, and Switzerland, and was declined by Germany. On the assembling of the delegates, Mr. Groesbeck said that the desire of the United States was simply to restore silver to its former position; to equalize gold and silver on a ratio to be fixed by agreement; and as a basis for conference submitted propositions as follows: 1. It is not desirable that silver should be excluded from free coinage in Europe and in the United States; and 2. The use of both gold and silver as unlimited legal-tender M. may be safely adopted: first, by equalizing them at a relation to be fixed by international agreement, and, second, by granting to each metal, at the relation fixed, equal terms of coinage, making no discrimination between them. At the sixth session, the delegates of the European states responded to the above propositions in substance: 1. That it is necessary to maintain in the world the monetary functions of silver as well as those of gold; but the selection of one or the other metal, or both together, should be governed by the special position of each state or group of states; 2. That the question of restricting the coinage of silver also should be left for determination to each state or group of states; and 3. That the apparent differences of opinion, and the fact that some states with the double standard find it impossible to agree with regard to the free coinage of silver, exclude discussion of the adoption of a common ratio between the two metals. The Italian representatives protested

against this response, because, in thus avoiding an answer to the proposition submitted, the conference would leave its task incomplete. They pointed out the fact that France had established a relation between the two metals 1785, and argued that if France had been able alone to accomplish the result, whenever France, England, and the United States should agree to establish together the relation, it would be established on an unshakable basis. The rejoinder of the U. S. delegates concurred with the majority's response that it is necessary to maintain in the world the monetary functions of silver as well as those of gold; affirmed that the special positions of states might become of secondary importance if it should be necessary to maintain the monetary functions of both metals; dissented from the reason assigned for then restricting the coinage of silver; admitted that some states with the double standard found it impossible to enter into a reciprocal engagement for the free coinage of silver, and said that they had come to the conference expressly to enter into such an engagement; and concurred in the conclusion of the response, believing it useless to agree upon a ratio between the two metals if the nations were not ready also to adopt a policy to uphold it.

Latin Monetary Union.—By a treaty at Paris 1865, Dec. 23, France, Belgium, Switzerland, and Italy formed a monetary association (to which Greece and Roumania were admitted 1867), for the purpose of regulating the weight, title, form, and circulation of their gold and silver coins. It was agreed that the association should remain in force till 1880, Jan. 1, and if not repealed within a year before the expiration of that term, should continue an additional period of 15 years, and so on till repealed. Several provisions in the original treaty have been modified, amended, or rescinded in subsequent conferences of the contracting govts. See LATIN UNION.

Recent U. S. Legislation.—For nearly 20 years the principal monetary legislation of the United States has been in reference to silver. In 1873 congress demonetized it; 1877 the house of representatives passed a bill containing a free-coinage clause, which was stricken out in the senate; and 1878 a bill was adopted remonetizing silver, entitled, 'An act to authorize the coinage of the standard silver dollar and to restore its legal-tender character,' which required the sec. of the treasury to purchase, at the market price, not less than \$2,000,000 worth of silver bullion per month, nor more than \$4,000,000 worth per month. From the passage of this act till 1889, Nov. 1, the govt. purchased 209,889,416.11 standard ounces of silver, at a cost of \$286,930,633.64, from which it coined 343,638,901 standard silver dollars. On the last date, 69,008,480 silver dollars were in circulation, and 203,539,521 were stored in govt. vaults, \$277,319,944 being covered by outstanding certificates. The annual coinage has been unequal, owing to the market price of silver, because the lower the price, the greater the quantity that must be purchased, and the larger the number of dollars to be

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coined, to comply with the act. During the above period, the govt. was seriously embarrassed in the distribution of the silver dollars. Wherever called for in quantities, they were shipped at govt. expense, but they soon found their way back into treasury vaults in payment of govt. dues and taxes. Since 1873 there has been in reality but one standard: 'The gold coins of the United States shall be a one-dollar piece, which at the standard weight of 25·8 grains shall be the unit of value . . .' (Rev. Stat. 3,511); but 'the silver dollar has been maintained at par with gold, the monetary unit, mainly by the provisions of law which make it a full legal tender, and its representative, the silver certificate, receivable for customs and other dues' (Sec. Windom). In domestic trade a silver dollar passes at par with a gold dollar, though it may have less intrinsic value, owing to fluctuations in the market value of bullion; but in foreign trade the silver dollar is received only for its bullion value. Some of the ablest financiers in the country have held the continued coinage of the silver dollar at a constantly increasing monthly quota, to be a disturbing element, and a positive hindrance to any international agreement looking to the free coinage of both metals at a fixed ratio. Among the remedies that have been proposed are: an international agreement fixing a ratio between silver and gold, and opening the mints of the leading nations of the world to the free coinage of both metals, at the ratio so established; the policy of purchasing and coining \$2,000,000 worth of silver per month; increasing the purchases and coinage of silver to \$4,000,000 per month, the maximum allowed by the act 1878; free coinage of standard silver dollars; coinage of silver dollars containing a dollar's worth of bullion; and an issue by the govt. of certificates to depositors of silver bullion, at the rate of one dollar for 412½ grains of standard silver.

Considering the conditions of the national finances and trade, the views of leading financiers, and the claims of the 'silver' and the 'anti-silver' men, Sec. of the Treasury Windom, in his official report 1889, Dec. 2, urged the adoption of the following plan: 'Issue treasury notes against deposits of silver bullion at the market price of silver when deposited, payable on demand in such quantities of silver bullion as will equal in value, at the date of presentation, the number of dollars expressed on the face of the notes at the market price of silver, or in gold at the option of the govt.; or in silver dollars at the option of the holder. Repeal the compulsory feature of the present coinage act.' Such notes should be made receivable for customs, taxes, and all public dues; be reissued when so received; and when held by any national banking assoc. should be counted as part of its lawful reserve. Should the price of silver advance between the date of the issue of a note and its payment, the holder of the note would receive a less quantity of silver than he deposited, but the exact quantity which could be bought in the market with the number of gold dollars called for

by his note at the date of payment. Should the price of silver decline, he would receive more silver than he deposited, but the quantity which could be purchased with the number of gold dollars called for by his note at the time presented for payment. Among the advantages claimed for the option to redeem the notes in gold were: investing the notes with additional credit, and preventing the withdrawal and redepositing of silver for speculative purposes. Under this plan it was urged that the sec. of the treasury should have discretionary power to suspend, temporarily, the receipt of silver bullion for payment in notes, when necessary to protect the govt. against combinations formed for the purpose of giving an arbitrary and fictitious price to silver. The advantages claimed for the whole measure were in brief: that it would establish and maintain a convenient and economical use of all the M. metal in the country; that it would furnish a paper currency not subject to arbitrary inflation, contraction, nor fluctuating values; that this utilization of silver would provide a market for the surplus product; that gold would be relieved of a part of the work that it would otherwise have to perform; that there would be no possibility of loss to the holders of the notes; that the public apprehension in regard to the over-issue of standard silver dollars would be quieted; and that the joint use of silver and gold as M. would be promoted.

Early in the session of congress 1889-90, silver bills were introduced into both houses, favoring and opposing free coinage. The house bill, prepared in a caucus of the republican majority, provided that the sec. of the treasury should purchase \$4,500,000 worth of fine silver each month at the market price, not exceeding \$1 for 371 $\frac{1}{4}$ grains of pure silver, and issue in payment for such purchase treasury notes from \$1 to \$1,000 in denomination. Such notes should be redeemed on demand in coin, and when redeemed be reissued; but no greater nor less amount of such notes should be outstanding at any time than the cost of the silver bullion then held in the treasury and purchased by the notes. All such notes should be a legal tender in payment of all debts, public and private, except where otherwise stipulated in a contract; be receivable for customs, taxes, and all public dues; and when held by a national banking assoc., be counted as a part of its lawful reserve. The bill repealed that part of the act of 1878 which required the purchase and coinage into silver dollars of from \$2,000,000 to \$4,000,000 worth of bullion monthly; and conditionally authorized free coinage thus: 'Sec. 6.—That whenever the market price of silver . . . is \$1 for 371.25 grains of pure silver, it shall be lawful for the owner of any silver bullion to deposit the same at any coinage mint of the United States to be coined into standard silver dollars for his benefit. . . .' This bill was adopted 1890, on June 7, by a vote of 139 ayes to 119 nays, and was then sent to the senate, where it was considered by the finance com-

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mittee in connection with a bill that originated in the senate. On June 17 the committee reported to the senate, in committee of the whole, the house bill with senate amendments, and it was adopted by a vote of 42 ayes to 25 nays. The bill in this form, renamed, 'An act to provide for the free coinage of gold and silver, and for other purposes,' was not only a free-coinage measure, but also a bimetallic one, and its passage was equally a surprise to friends and opponents. It provided that, from the date of the passage of the act, the unit of value in the United States should be the dollar; that the same might be coined of $412\frac{1}{2}$ grains of standard silver, or of $25\frac{8}{16}$ grains of standard gold; that said coins should be legal tender for all debts, public and private; that thereafter any owner of silver or gold bullion might deposit the same at any mint of the United States, to be formed in standard dollars or bars for his benefit, and without charge; that the provisions of the act remonetizing silver (1878) should apply to the coinage provided for by the present act; that the certificates authorized by the 1878 act, and all silver and gold certificates already issued, shall be of not less than \$1 nor more than \$100 in denomination, and shall be redeemable in coin of standard value; that the provision of the 1878 act requiring the sec. of the treasury to purchase from \$2,000,000 to \$4,000,000 worth of silver bullion per month be repealed; and that the certificates provided for in the present act, and all silver and gold certificates already issued, should be receivable for all taxes and dues to the United States, of every description, and be a legal tender for the payment of all debts, public and private. The bill also contained important provisions relating to the national banks, among which were: that upon the passage of the act, the balances standing with the treasury of the United States to the respective credits of national banks for deposits made to redeem the circulating notes of such banks, and all deposits thereafter received for like purpose, should be covered into the treasury, as a miscellaneous receipt; that the treasurer should redeem from the general cash in his charge the circulating notes of said banks which might come into his possession subject to redemption; that on the certificate of the controller of the currency that such notes had been received and destroyed by him, and that no new notes would be issued in their place, reimbursement of their amount should be made to the treasury; that the reimbursement should be from an appropriation, created by the act, to be known as 'national bank notes: redemption account;' but that these provisions should not apply to the deposits (5 per cent. of circulation) required of national banks by act of 1874. The bill was at once sent to the house for concurrence, and by the speaker was referred to the committee on coinage, weights, and measures. Subsequently it was referred to a special conference committee, who reported a compromise bill, commonly though inaccurately designated as the Sherman bill, which went into operation

Aug. 13. This bill provided that the sec. of the treasury should purchase an aggregate of 4,500,000 ounces, or so much as might be offered, of silver bullion, per month, at the market price, not exceeding \$1 for 371·25 grains of pure silver; that he should issue treasury notes in payment; that such notes should be redeemable in coin and be reissued after redemption; and that the sec. of the treasury should coin each month 2,000,000 ounces of silver bullion, so purchased, into standard silver dollars, till 1891, July 1, and after that time should coin only so much as might be necessary to redeem the treasury notes issued for the purchase of silver bullion.

Under the law of 1878, known as the Bland-Allison law, the government purchased 291,292,019 ounces, at a cost of \$308,199,262, and issued silver certificates or coined dollars to the amount of \$378,166,795. Aug. 7, 1893, Pres. Cleveland called an extra session of congress to consider the money question, and after three months' debate the 'purchasing clause' of the act of 1890, known as the Sherman law, was repealed, Nov. 1, 1893, the remainder of the law still being left in force. Under the provisions of the Sherman law \$152,000,000 treasury notes were issued in payment for silver bullion.

See CURRENCY: BANK—BANKING: BIMETALLISM: FINANCE: MINT: SILVER: GOLD.

MONGE, *mōngzh*, GASPARD, Comte de Péluse: French mathematician and physicist: 1746, May 10—1818, July 28; b. Beaune, dept. of Côte d'Or; of humble parentage. When only 15 years of age, he went to study nat. philosophy at the Oratorian College of Lyon, and afterward obtained admission into the famous artillery school at Mézières, where he invented the method known as 'Descriptive Geometry.' In 1780, he was chosen a member of the French Acad., and was called to Paris as prof. of hydrodynamics. During the heat of the Revolution, he became minister of marine, but soon took charge of the great manufactories for supplying republican France with arms and gunpowder. After he had founded the École Polytechnique, he was sent by the directory to Italy. Here he formed a close friendship with Bonaparte, whom he followed to Egypt; and undertook the management of the Egyptian Institute. On his return to France, he resumed his functions as prof. in the École Polytechnique, and, though his reverence for Napoleon continued unabated, he hotly opposed his aristocratic and dynastic views. The title of Comte de Péluse (Pelusium) was conferred on him by Napoleon. He died at Paris. M.'s principal works are: *Traité Élémentaire de Statique* (7th ed. Paris 1834); *Leçons de Géométrie Descriptive*; and *Application de l'Analyse à la Géométrie des Surfaces du 1 et 2 Degré*.

MONGER, n. *mūng'gér* [Icel. *mangari*, a dealer—from *manga*, to chaffer, to trade—from *mang*, barter: Dut. *manghelen*, to exchange]: a dealer; a trader—now used only as the second element in a compound, as *fish-monger*.

MONGHYR—MONGOLIA.

MONGHYR, *mon-ghēr'*, or **MUNGIR**, *mŭn-ghēr'*: city of India, cap. of a dist. in Bahar, Lower Bengal; picturesquely situated on the right bank of the Ganges, 30 m. w.n.w. of Bhagulpur. It is a large and thriving town, and carries on manufactures of hardware and firearms. It was formerly a fortress of great natural strength, and is a favorite residence of invalided military men and their families. Pop. (1881) 55,372; (1891) 57,077.

The *district* of M. 3,921 sq. m. Pop. (1891) 2,036,021.

MONGOLIA, *mŏn-gō'li-a*: country in Asia, a dependency of China proper, extending from the great wall on the n. of China to Siberia, and from Manchuria on the e. to the Altai Mts. and Turkestan on the w.; lat. 37°—54° n., long. 85°—125° e.; about 1,300,000 sq. m.; since 1368 subject to the emperors of China, but originally the fatherland of the Mongols (q.v.), whose chieftain, Genghis Khan (q.v.), created an empire of unexampled extent (1227), and whose grandson, Kūblai Khan (q.v.), became the founder of a Mongol dynasty of China (1279–1368). One-fifth of the inhabitants are Chinese of China proper, who have pressed into M. from the s. side of the great wall. M. is a vast plain, about 3,000 ft. above sea-level, almost without wood and water, and has as its centre, and a third of its area, the desert of Gobi (q.v.) or Shamo, 'sand-sea.' It is divided into four principal regions: 1. Inner M., with the great wall on the s., the desert on the n., and on the e. to the Ala-shan (mts.); 2. Outer M., from the w. end of the desert to the Altai Mts.; 3. A s.w. district w. of the Ala-shan range; and 4. The n.w. region about Uliassutai, a considerable town in a well-cultivated valley. The Altai Mts. send subordinate ranges, the Tangnu-Oola and Kenteh, eastward through n. M.; and the Ala-shan, In-shan, and Khingan ranges reach across e. M., running n.e. and n. into Manchuria. The rivers Kerulen, upper Nonina, and Argun, in the n.e. of M., mark the original camping-ground from which the Mongol tribes spread. The Selenga, Orkhon, and Tola are n.-central streams flowing into Lake Baikal. The Hoang-Ho or Yellow river crosses the s.e. region. In the n.w. region lakes abound, of which Lakes Kossogol, Ubsa, and Ike-aral are of considerable size. The very dry air and extreme elevation of M. give a climate so excessively cold that the mercury often remains frozen for several weeks. The winter lasts nine months, and during the short summer there are sometimes days of stifling heat, though almost never without cool nights. Sudden and great changes are common at all seasons. The soil of M. is mostly poor, and is difficult of cultivation on account of the little rain or snow falling anywhere except near the mountain ranges. In the s. part of M., where the Chinese have come in largely, and introduced regular cultivation of the ground, to which the nomad Mongols are not addicted, tillage appears to have made possible crops which formerly would not ripen. These Chinese immigrant agriculturists are causing many of the native Mongols to give up the s. part of M., while many others have changed from

a nomad to a settled life. The vast plains and mountain ranges of M. are abundantly supplied with wild animals: the elk, stag, goat, ass, yak, two species of tiger, the brown and the black bear, wolves so fierce that they will attack the shepherd rather than his flock, foxes, hares, and squirrels; pheasants and eagles, the latter so favored that they make their nests in any place without fear, almost as if domesticated. The chief property of the native Mongols is in horses, cattle, sheep, and the double-humped or Bactrian camel, which is both domesticated and wild, and as a domestic animal yields large supplies of milk, butter, and cheese. Chinese and Russian trade, entering M. through the border-town of Kiakhta, introduces European goods. The religion of M. was changed in the 13th c. from a species of Shamanism to Lamaism akin to that of Thibet; and the country abounds in the lamaseries or monasteries of Lamaism, solidly built with stone and brick, adorned with carvings, sculpture, and paintings, well endowed, and in those of the first rank having in residence a living Buddha who is worshipped as a divine incarnation.—Pop. of M. 2,580,000.

MONGOLIAN, n. *mŏn-gō'li-ăn*: native or inhabitant of *Mongolia* (see MONGOLIA: MONGOLS): ADJ. term applied to one of the great divisions of mankind, having the Mongols and Chinese as the type: term applied sometimes to the whole class of Turanian tongues; sometimes specifically to that group spoken by the Kalmucks and other tribes from Thibet to China. MONGOL, or MONGOLE, a. *mŏn'gŏl* [native Tartar name]: of or belonging to Mongolia. MONGOLIDÆ, n. *mŏn-gŏl'i-dē*: name given by Dr. Latham to what Blumenbach, Cuvier, and others had called the Mongolian race.

MONGOLS, *mŏng'gŏlz*: term, with an inconvenient variety of applications, for larger or smaller groups of Asiatic races or tribes. In Blumenbach's fivefold classification of mankind the M. were one branch, as in Latham's threefold division the Mongolidæ constituted one. In this sense the M. correspond to those races speaking Turanian Languages (q.v.; and see ETHNOLOGY: PHILOLOGY)—almost all the Asiatic peoples not Aryan or Semitic. Thus taken, the name Mongolic may be used for the yellow type of man, as distinguished from the Caucasian or fair type, but should not be understood as implying racial relationship, or direct connection between their languages. They have been thus grouped: 1. Tibeto-Burman; 2. Khasi, and 3. Mon (in Assam and Pegu); 4. Tai (including Siamese, Shans, and Laos); 5. Sinico-Annamitic (Chinese, Tonquinese, etc.); 6. Koreo-Japanese; 7. Ural-Altaic; and 8. Malayan. The seventh group, Ural-Altaic, embraces M. in the stricter sense; as well as Tungûs (q.v.) and Manchus (see MANCHURIA), Turkish races (see TURKESTAN: TURKS), Samoyedes (q.v.) and Ugrians, including Finns (q.v.) and Hungarians. The M. proper fall into an eastern branch, inhabiting Mongolia (the n. section of the central-Asian plateau, between the

MONGOLS.

Kuen Lun and the Altai [q.v.] system, including the Shamo desert, and divided into e. and w. Mongolia); a western branch, of which the Kalmucks (q.v.) are the principal representative; and the Buriats on the slopes of the Altai, e. and w. of Lake Baikal. The e. M., who occupy the original seat of the race, remain the most characteristic of the race; of whom the Khalkhas, in the n. of Mongolia, are the chief tribe. They are thoroughly nomadic, living in tents of felt, and moving about when the pasture has all been used. They are frank, hospitable, temperate, and (though their ancestors were long the terror of the world) peaceable, but lazy and dirty. Their wealth is in flocks of sheep, camels, horses, and cattle; and they live mainly on flesh, milk, cheese, and butter. They pay yearly tribute to China, and have Chinese colonists scattered among them. See MONGOLIA.

The face of the typical Mongolian is broad and flat, because the cheek-bones stand out laterally and the nasal bones are depressed. The eyes are oblique and wide apart. The eyebrows are scanty. The iris is dark, the cornea yellow. The complexion is tawny, the stature low. The ears are large, standing out from the head; the lips thick, the forehead low and flat, and the hair lank and thin. Of course, this does not apply to the more civilized nations of Mongolic affinities, such as the Turks and Magyars, especially the latter, who, in physical appearance, differ little from other European nations. The name of Tartar, or rather Tatar, belonged originally to the M. proper, but passed later to the Turks and Tungusic peoples.

Early in ancient history we find a Turanian race (Ae-cadians—perhaps Turkish) constituting the more cultured section of the Babylonian state. Another great offshoot from the Mongolic stock founded an empire in China. In early Greek history, the M. or Tatars figure as Scythians, and in late Roman history as Huns, carrying terror and desolation over the civilized world. The history of the M. begins in the 13th c., when Genghis Khan, originally the chief of a small Mongol horde, gradually united various Mongol and Tatar tribes, and conquered almost the whole of central and eastern Asia. For his conquests, see GENGHIS KHAN. His sons and grandsons were equally successful, and 1240–1 the Mongol empire extended from the seaboard of China to the frontiers of Germany and Poland, including Russia and Hungary, and the whole of Asia, with the exception of Asia Minor, Arabia, India and the Indo-Chinese states, and n. Siberia. The cap. was Karakorum (q.v.). In the bloody battle of Wahlstatt in Silesia (1241), Germans and Poles checked the westward course of the orientals. The M. became partly Buddhists, partly Moslems; and the vast empire soon broke up into a number of independent kingdoms (see KUBLAI KHAN: KIPCHAK). The M. were driven out of China 1368, and in the 15th c. their domain in Russia ceased. From Turkestan, however, arose another tide of Mongol and Turkish invasion, under the guidance of

MONGOOSE—MONILIFORM.

Timûr (q.v.) or Tamerlane, who, in the later part of the 14th c., reduced Turkestan, Persia, Hindûstan, Asia Minor, and Georgia under his sway, and broke, for a time, the Turkish power. This empire was finally absorbed by the Persians and Usbeks; but an offshoot of Timûr's family founded, in the 16th c., the great Mongol empire of Delhi, hence called Mogul or Mughal, another way of writing Mongol (see BABER). After the decline of Timûr's empire, the Turks spread terror to the very heart of w. Europe. In the 9th c., the Magyars, a tribe of Ugrians, established themselves in Hungary. See TURKS: OTTOMAN EMPIRE: HUNGARY.

For the various Mongoloid peoples, their character, language, and religions, see the numerous titles referring to them or to the countries where they are found. The most recent ethnological and philological schemes exclude from the Mongolic or Mongoloid group various races or stocks formerly accounted Mongol, or even called Turanian. Thus the Dravidian and Kolarian races of s. India are set down as of doubtful affinity; also the Singhalese, the Khmer in Cambodia, the Ainos in Yesso, the Chukchis, Koriaks, Kamtchadales in Siberia.

The first five groups of the Mongolic races use the languages known as Isolating or Monosyllabic (see PHIL-OL-OGY), though no positive relationship can be proved to exist between the main divisions of these tongues; the remaining groups have the tongues known as agglutinating. The languages of the Ural-Altaic peoples (to which the name of Turanian may with advantage be confined) are now generally held to be fundamentally related, and are typically agglutinative. It seems less clear that the nations who speak them are of one blood, as much intermixture with Caucasian peoples has brought great diversity of type. The Korean and Japanese, also agglutinative, show no affinities to the Ural-Altaic speech.

In religion, a large portion of the Mongoloid peoples are Buddhist (see BUDDHISM—BUDDHA: LAMAISM, under LAMA), though heathenism, Mohammedanism, and Christianity have their followers. The M. proper are mainly Buddhist; many are Shamans (see SHAMANISM), and some of the Buriats have conformed to the Greek Church. See Howorth, *History of the M.* (1880); Gilmour, *Among the M.* (1883).

MON'GOOSE, or MUN'GOUS (quadruped): see ICH-NEUMON.

MONGREL, a. *mŭng'grĕl* [It. *mongrellino*, of mixed breed: Dut. *menghen*, to mingle—with the dim. termination *rel*]: of a mixed breed; of different kinds: N. an animal of a mixed breed, particularly a dog.

MONIED: see under MONEY.

MONILIFORM, a. *mŏn-ĭl'ĭ-fawrm* [L. *monĭlĕ*, a necklace; *forma*, shape]: like a necklace; jointed or united so as to resemble a string of beads.

MONIMENT—MONITION.

MONIMENT, n. *mŏn'ĩ-měnt* [see **MONUMENT**, of which it is another spelling]: in *OE.*, a memorial; a record; an image.

MONIMIACEÆ, *mŏn-ĩm-ĩ-ă'sē-ē*: a natural order of exogenous plants, consisting of trees and shrubs, with opposite leaves destitute of stipules; the bark and leaves having an aromatic fragrance. There are about 40 known species, natives chiefly of South America. The fruit of the **BOLDU** (*Boldoa fragrans*), a shrub or small tree, a native of Chili, is eaten.

MONISM, n. *mŏn'izm* [Gr. *monos*, one, alone]: a system of modern materialism which teaches the identity of matter and mind.

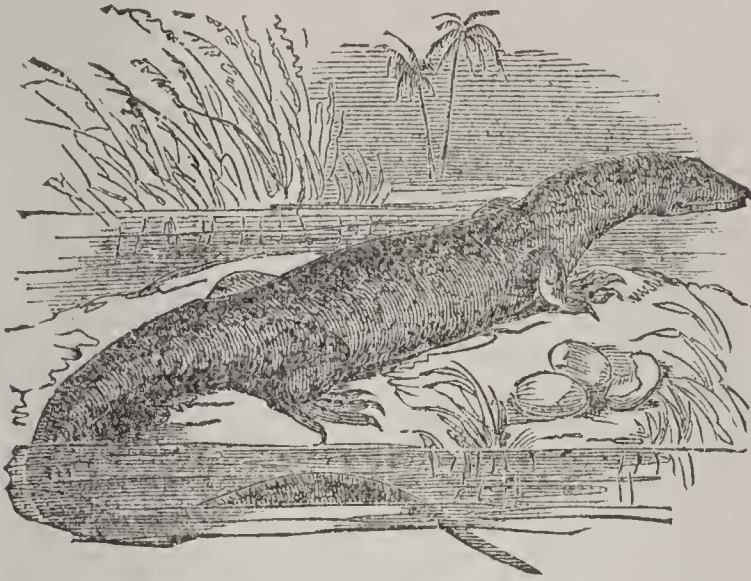
MON'ITA SECRE'TA SOCIETA'TIS JES'U: work by an unknown author, purporting to be a collection of secret instructions for the Jesuit order; published first at Cracow 1612, in Latin, from the Spanish; often republished since in various languages. In the 17th c. it was regarded as genuine by Prot. historians generally. The almost universal verdict of recent scholarship is that the work is either a forgery or a satire. See **JESUITS**.

MONITEUR, **LE**, *lēh mo-nĩ-tēr'*: French journal of wide repute, started by the publisher, Charles Joseph Pankoucke, 1789, May 5, under the title *Gazette Nationale, ou le Moniteur Universel*. During the Revolution its importance immensely increased. In 1800 it divided itself into halves, of which the first contained the *Actes du Gouvernement*: this change imparted to the journal something of an official character. After 1811, Jan. 1, it dropped the title *Gazette Nationale*, retaining the title *Moniteur Universel*. After the restoration, it became the govt. organ, which it continued to be until 1869, when its official connection was discontinued.

MONITION, n. *mō-nĩsh'ŭn* [F. *monition*, admonition—from L. *monitiōnem*, counsel, advice]: instruction given by way of caution; warning: in *English ecclesiastical courts*, the lightest form of church censure, in the form of an order whose disregard entails the penalties of contempt of court. **MONITIVE**, a. *mŏn'ĩ-tĩv*, warning; admonitory. **MONITOR**, n. *mŏn'ĩ-tēr* [L.]: one who warns of faults or gives instruction in regard to duty; an older boy in a school who assists the master—the girl who does so is called a **MONITRESS**, *mŏn'ĩ-trēs*: one of a family of lizards (see below): an iron steam-vessel of war having its guns in a raised turret (see **TURRET-SHIP**). **MON'ITO'RIAL**, a. *-tō'rĩ-ăl* [F.—L.]: of or relating to a monitor; teaching by monitors. **MON'ITO'RIALLY**, ad. *-lĩ*. **MON'ITORSHIP**, n. *-tēr-shĩp*, the office of a monitor. **MONITORY**, a. *mŏn'ĩ-tēr-ĩ*, giving or containing warning or advice.

MONITOR.

MONITOR, *mŏn'ī-tēr*: name given to many species of saurian reptiles, nearly allied to the true lizards, from which they differ in having no teeth on the palate.



Monitor (*M. Niloticus*).

Among them are some of large size, the largest of existing saurians except those of the crocodile tribe. The tail of the greater number is laterally compressed, the better to adapt them to aquatic habits. They receive the name *M.* from a notion that they give warning by a hissing sound of the approach of a crocodile or alligator. For the same reason, some of the American species receive the French name *Sauvegarde*. Those of the old world form the family *Monitoridæ*, and those of America the family *Teiïdæ* of some naturalists. There are several genera of both.—The *M.* or VARAN OF THE NILE (*M. Niloticus*) is of rather slender form, and has a long tail: it is olive gray, mottled with black. It attains a length of five or six ft. Crocodiles' eggs form part of its food.—The TEGUEXIN (*Teius Teguxin*) of Brazil and Guiana is of similar size: it preys on aquatic animals. Other large species are plentiful in almost all tropical countries. They are powerful animals, have strong teeth, and defend themselves vigorously if attacked. Some comparatively small species, feeding chiefly on insects, are found in dry situations. Some of the large S. American species are used for food.

MON'ITOR; see TURRET-SHIP.

MONITORIAL SYSTEM.

MONITORIAL SYSTEM, or MUTUAL INSTRUCTION: method of organizing schools and providing the requisite teaching power; applied first by Andrew Bell, D.D. (q.v.), when supt. of the Orphan Hospital, Madras, 1795. He made use of the more advanced boys in the school to instruct the younger pupils: these youthful teachers were called Monitors. The method was eagerly adopted by Joseph Lancaster, who in the first years of the 19th c. did so much for the extension of popular education in England; and from him and the originator, the system was called indifferently the Madras and the Lancastrian, as well as the Monitorial or Mutual System. At a time when the whole question of primary education was in its infancy, the state refusing to promote it on the ground that it was dangerous to society, and the public little disposed to contribute toward its extension, it was of great importance that a system should be adopted which should recommend itself as at once effectual and economical. It was manifest that even with the most skilful arrangement of classes, a single teacher could not undertake the tuition of more than 80 or 90 pupils; while, by the judicious employment of the cleverer boys under the general direction of the master, the school might be made almost self-working, and 300 or 400 children taught where there was only one adult superintendent. The novelty and economy of this plan of using more advanced scholars as helpers to the adult teacher, who could thus extend his number of pupils from 80 or 90 to 300 or 400, commended the system at a time when public primary education was deemed by many an expensive luxury; and the M. S. gained large and enthusiastic support in Britain and in Germany. But the value of the system was much overrated; for though technical and rote subjects may be taught by monitors, yet children so instructed are not in any sense of the word educated. Their monitor necessarily lacks the maturity of mind indispensable to the instructor, whose business it is to arouse the mental activity of the child, and to lead him to an intelligent grasp of intellectual and moral and physical truths. Thus as education took a more scientific development, the M. S. was largely discarded. The reaction against the system, however, was not so violent in Great Britain or in Holland and France, as in Germany. In England, and to a small extent in the United States, the M. S. is in use in a modified form which secures for the master the aid of the more advanced pupils in teaching rote subjects, in revising lessons, keeping registers, and supervising and reporting the work of a limited number of classes. The M. S. in this very restricted application affords means of training for the teaching profession pupils who seem fitted by natural endowment for the work. Hence the prevalent employment in Britain of paid monitors and pupil teachers (male and female), regularly apprenticed to school-managers and teachers, and in time going onward to be trained in normal schools.

MONK.

MONK, n. *mǔngk* [Ger. *Mönch*; L. *monachus*; Gr. *monachos*, a solitary, a monk—from Gr. *monos*, alone; *ēchō*, I keep]: one who devotes his life exclusively to religious concerns, and lives under a certain rule or discipline—generally in a community or order in a monastery; a recluse; a solitary one (see **MONACHISM**: **MONASTERY**). **MONK'ISH**, a. *mǔngk'ish*, pertaining to a monk, or like one. **MONK'HOOD**, n. *-hūd*, condition or character of a monk. **MONKERY**, n. *mǔngk'ēr-ī*, monastic life, in reproach. **MONK'S-HOOD**, a poisonous plant—so named from the cowl-like shape of the flowers; the aconite; the *Aconitum napellus*, ord. *Ranunculaceæ* (see **ACONITE**). **CLOISTER MONK**, one who lives in the monastery. **EXTRA-MONK**, one who lives outside and serves a church connected with the monastery. **MONK-FISH** (see **ANGEL-FISH**). **MONK'S-RHUBARB**, a species of water-dock, the *Rumex alpinus*, ord. *Polygonaceæ* (see **DOCK**). *Note*.—As regards persons living secluded from the world in religious houses, the males are called *monks*, and the females *nuns*; the residence of a monk is called a *monastery*, and that of a nun a *nunnery* or *convent*.

MONK, *mǔnk*, **GEORGE**, Duke of Albemarle: 1608, Dec. 6—1669, Dec. 3; b. Potheridge, near Torrington, Devonshire; second son of Sir Thomas M. of Potheridge. He spent some of his earlier years in the service of Holland, returned to England when about the age of 30, and served in the king's army against the Scots 1639, attaining the rank of lieut.col. On the breaking out of the Irish rebellion, 1642, he was appointed col. of Lord Leicester's troops, sent to crush it. When the civil war began, these troops were recalled, and M. was imprisoned on account of being supposed to favor the cause of the parliament, but was soon released. In 1644, he was defeated and taken prisoner by Fairfax, in command of the parliamentary army, and imprisoned in the Tower, from which he was liberated, after two years, on his swearing the covenant. Clarendon hints that he sold himself for money. He was now intrusted with the command in n. Ireland. Cromwell had a high opinion of his military talents, and made him his lieut.gen. and commandant of artillery; and the service which he rendered at the battle of Dunbar was so great, that he was intrusted with the chief command in Scotland. In 1653, he was joined with Admiral Blake in an expedition against the Dutch, and with his division of the fleet, consisting of 100 ships, defeated Admiral Van Tromp off Nieuwpoort, and fought another and very sanguinary battle with him off Katwijk, in which the victory was doubtful, but Van Tromp lost his life. 1654, April, Cromwell sent him to Scotland as gov., in which difficult office he conducted himself with vigor, moderation, and equity. Even the highlands, those immemorial 'sanctuaries of plunder,' as Guizot calls them, were reduced to order. Finding Cromwell's chief opponents in Scotland to be the Presb. clergy, he reduced their prerogatives, and disallowed their general assemblies, leaving them their local presbyteries. His



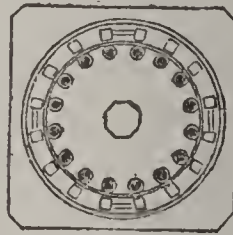
Howling Monkey (*Mycetes ursinus*).



a, Monochlamydeous Flower—*Daphne Mezereum*; *b*, Perianth cut open to show the single envelope.



Monkey.—Rib-nosed Baboon (*Cynocephalus Maimon*).



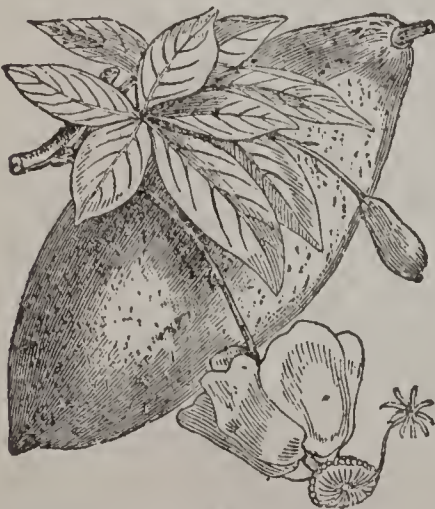
Plan of Monopteron.



Monopetalous Flower.



Monœcia.



Foliage, Fruit, and Flower of Monkey-bread tree (*Adansonia digitata*).



Monomyaria.—*a*, Impression of the single adductor muscle

principal residence was Dalkeith, where he spent his leisure hours in gardening, of which he was very fond. When, after Cromwell's death, he saw everything in confusion, and felt his own position perilous, he crossed the English border, 1660, Jan. 1, with 6,000 men, united his troops with those which Fairfax had collected for Charles II., and entered London unopposed, though as yet he kept his views and intentions profoundly secret. His powers of dissimulation, self-control, and reticence were immense. Everybody felt that the decision lay with 'Old George,' as his soldiers used to call him; every party courted him; he was even offered the protectorate; but while he offended nobody, he declined to connect himself with any of the sectaries, and with trained evasion withheld a clear expression of his own judgment regarding the restoration, and waited patiently the course of events. His own secret wish (though it did not proceed from any very high-minded motive) was to bring back the Stuarts; and before long, he saw that the nation in general was thoroughly with him, and was indeed looking to him for leadership in the recall. So, 1660, Feb. 21, he called together the remaining members of the parliament which had been violently driven out 12 years before, and Charles II. was presently recalled. The king after his restoration made M. Duke of Albemarle, loaded him with honors, and intrusted him with the highest offices in the state. But he soon retired from political affairs. In 1665, when the plague ravaged London, and every one fled that could, 'Old George,' as gov. of the city, bravely stuck to his post, and did what he could to allay the terror and confusion. Next year, he was employed as second in command of the fleet sent under the Duke of York against the Dutch; and was defeated by Von Ruyter in a sea-fight off Dunkirk, but soon afterward gained a bloody victory over him off North Foreland.—M., as he appears in history, was a man of great abilities, with wonderful patience and self-restraint; yet as a man whose principle in all public action was to wait for the tide, and to be found with it, and as it were leading it, when it rose. His selfishness was never brutal, never reckless; but it was deep and abiding. He gives no sign of any vulgar vaulting ambition, any more than of a glowing patriotism. His rare self-possession seems to have supplied an element serviceable to the state in those times of universal excitement. As a military commander he was admirable; a great general, a strict disciplinarian, yet always careful to attach his soldiers to himself, so that they cordially loved him. Guizot describes him as a 'man capable of great things, though he had no greatness of soul.' See Guizot's *Monk*, Chute de la Republique, Skinner's *Life of Monk*, Hallam's *Constitutional History*, and Macaulay's *History of England*.

MONKEY.

MONKEY, n. *mǔng'kǐ* [Bret. *mounika*, a female ape: O.It. *monicchio*, a monkey—a dim. of O. It. *mona* or *monna*, a poor or old woman, a dame in ridicule, a monkey: a familiar corruption of It. *madonna*, my lady: Sp. *mono*, a monkey]: the animal that most resembles man, and is placed highest in the systematic scale; one of the quadrumana, especially a long-tailed one; a term of contempt or reproach for a mischievous person; an apparatus for disengaging and for securing in turns the ram of a pile-driving machine. **MON'KEYISM**, n. *-izm*, the qualities of a monkey. **MONKEY-BLOCK**, a small single block strapped with a swivel. **MONKEY-BREAD**, the baobab-tree, the slightly acrid pulp of whose fruit is used as an article of food by the natives of Africa; the fruit of the *Adansōnīā digitātā*, ord. *Sterculiācēæ*. **MONKEY-JACKET**, a short spencer or thick pea-jacket. **MONKEY-POTS**, the woody capsules of the *Lecythis ollārīā*, a large Brazilian tree, ord. *Myrtācēæ* (see *LECYTHIDACEÆ*). **MONKEY-RAIL**, a second and lighter rail raised about six inches above the quarter-rail of a ship. **MONKEY-WRENCH**, a wrench or spanner having a movable jaw. *Note.*—*Baboons* have short tails, *apes* have none.

MONK'EE (*Simia*): Linnæan genus of *Mammalia*, of the Linnæan order *Primates*, and of Cuvier's order *Quadrumana*, now constituting the family *Simiadaæ*. The word M. was formerly of almost, if not altogether, the same signification with *Ape*; but the term *ape* is now more generally applied to those *Simiadaæ* which have no tail, and no cheek-pouches; the name M. to those which have cheek-pouches and long tails, prehensile or not prehensile; while the name *Baboon* (q.v.) is applied to creatures considerably different from both. The smaller tailless *Simiadaæ* are, however, still frequently spoken of as monkeys, and the term is also sometimes used to comprehend all the *Simiadaæ*.

Of all animals, the *Simiadaæ* show the greatest resemblance to man, both in general form and in anatomical structure. This is particularly the case with some of the larger apes. In none, however, is there a natural adaptation for the erect position so characteristic of man, which is assumed rarely, and in general only by captive individuals, as the result of training and constraint—all of the M. tribe preferring to walk on four feet rather than on two, but all being adapted for living chiefly among branches of trees, or—according to the habits of a comparatively small number of species—among bushy cliffs, where they make use of the four extremities for prehension, as hands. Most of them leap from branch to branch with wonderful agility, and some also swing themselves from a branch by their long prehensile tail, till they can seize hold of another branch. The thumb, in all the four extremities, is opposable to the fingers, which are long and flexible; but there are some monkeys which lack the thumb of the fore-limbs, or have it merely rudimentary, while the hind-limbs are always furnished with perfect hands. In attempting to walk erect, an ape

MONKEY.

necessarily treads, not on the soles, but on the sides of its feet, which are turned inward, and the muscles of the legs do not enable it to maintain an erect position long or easily. This difficulty is increased by the way in which the head is affixed to the vertebral column, the *occipital foramen* being further back than in man, so that the weight of the head is thrown forward.—The face of a M. exhibits a grotesque resemblance to that of man; but the lower forehead, the less perfect nose, and the more projecting jaws, give it a brutal character. The dentition of monkeys is so similar to that of man, that the dental formula for very many is the same, though many others have an additional molar on each side of each jaw; but in many, the great size of the canine teeth is a marked brutal characteristic.—The digestive organs are generally very similar to those of man, but in some of the *Simiadae*, more exclusively confined to vegetable food, there is a remarkable difference in a peculiar and very complicated structure of the stomach.—The food of monkeys consists chiefly of fruits, corn, and other vegetable substances; but most of them also catch and eat insects, and even birds, of the eggs of which they are very fond. In captivity, they learn to eat and drink almost everything that is used by man, and show a great fondness for sweet things, and for alcoholic liquors.—The skin of monkeys is generally covered in all parts with hair, but some have the face partially naked, and many have naked callosities on the buttocks.—Many have capacious cheek-pouches, in which they stow away food which they cannot consume with sufficient expedition. They are mostly gregarious, though there are some exceptions. Many of the species display strong attachment to their mates and to their offspring. One or two young are usually produced at a birth. They display remarkable propensity and talent for imitation; and this, with their extreme agility, their curious prying disposition, and their love of trick or mischief, makes them very amusing, whether in a wild or a captive state. Many of the stories told of monkeys evince much intelligence, though probably none of the species exceed in intelligence the dog or the elephant. Notwithstanding their resemblance to the human form, their imitative propensity, and their intelligence, none of the monkeys show the least capacity for imitating the human voice; and their ‘chattering’ is very unlike articulate speech.

The species of this family are very numerous, but all are confined to the warm parts of the world; Australia, however, and the South Sea Islands are destitute of them. They are divided into a number of genera, some of which belong exclusively to particular portions of the world. But in this respect, the most remarkable fact is the difference between those of the old world and those of America, the geographical distribution corresponding with the division of the family into two principal groups—the monkeys of the old world (*Catarrhini* of some naturalists), to which alone the name *Simiadae* is some-

MONMOUTH.

times restricted, having the nostrils separated only by a narrow septum, and the tail wanting, short, or long, but never prehensile; the monkeys of the new world (*Platyrrhini*), the family *Cebidæ* of some naturalists, having the nostrils widely separated, the tail always long, and often prehensile, most of them having also the four additional molar teeth above noticed, which none of the monkeys of the old world possess; but none of them having cheek-pouches, which many of the monkeys of the old world have. For the most interesting genera and species of M., see the separate titles.

MONMOUTH, *mön'müth*: maritime county in the w. of England, bounded s. by the estuary of the Severn, w. by Glamorgan; greatest length n. to s. about 35 m.; greatest breadth about 28 m.; about 572 sq. m., or 368,399 acres. The chief rivers are the Usk, the Wye on the e. border, and the Rumney on the w. border—all flowing s. into the estuary of the Severn. The coast-line, 22 m. in length, is indented only at the mouth of the Usk (which is navigable for vessels of the largest size to Newport), and at the mouth of the Wye, which vessels ascend to Chepstow. The surface is elevated in the n. and n.w. (the Sugar-loaf is 1,954 ft. high); but the coast districts, comprising the Wentloog and the Caldecot Levels, are low and rich, and are protected from the wash of the sea by sea-walls and earthworks. In the fertile valleys of the Usk and Wye, wheat is the principal crop; but in the less favored localities, barley and oats chiefly are grown. Coal, limestone, and ironstone abound in the mineral district in the n.w. of M. This district, 89,000 acres, abounds in collieries and ironworks, and is a network of railways. M. was a Welsh county until the reign of Henry VIII., but the ancient language is now heard in only a few western districts. The scenery is unusually beautiful; and in no part of England are to be found so many remains of feudal castles as in the e. districts of this county: the chief remains are Raglan, Caldecot, and Chepstow castles; and Llanthony and Tintern (q.v.) abbeys. Roman antiquities are numerous. Pop. (1871) 195,448; (1881) 211,374; (1891) 252,260; (1901) 230,800.

MONMOUTH, *mön'müth*: city, cap. Warren co., Ill.; 28 m. e. and n. of Burlington, Io., 47 m. s. of Rock Island. The Chicago Burlington and Quincy, and the Rockford Rock Island and St. Louis railroads here intersect. It has 11 churches, a commercial college, excellent schools, two public libraries, court-house, opera house, three newspapers, three national banks, and four hotels. It is the seat of Monmouth College and the Theological Seminary of the Northwest, both conducted by the United Presbyterians. There are three large shops for making agricultural implements. Bituminous coal is obtained in the vicinity. Pop. (1880) 5,000; (1890) 5,930; (1900) 7,460.

MONMOUTH.

MON'MOUTH: parliamentary and municipal borough and market-town of England, cap. of the county of M.; amid beautiful scenery, at the confluence of the Monnow and the Wye, 21 m. w.s.w. of Gloucester. Its church, dating from the 14th c., is surmounted by a lofty spire. Of its castle, favorite residence of John of Gaunt, and birthplace of Henry V., the ruins only remain. A building, said to be the study of Geoffrey of Monmouth, is all that remains of the Benedictine monastery. Railways connect the town with Newport on the w. and Ross on the e. Pop. (1881) 6,112; (1891) 5,470.

MON'MOUTH, BATTLE OF: contest in the revolution; at Freehold, Monmouth co., N. J., 1778, June 28, between the Americans under Washington and the British under Sir Henry Clinton. The latter having evacuated Philadelphia June 18, were on their way to Sandy Hook, with the Americans in pursuit. Clinton's main army was encamped on the high ground around Monmouth court house, in Freehold, when early on June 28, Gen. Lee attacked them with his advance guard of 4,000, while yet the main army was 3 m. away. Lee was at first successful, but afterward was completely routed, his men retreating in confusion until Gen. Washington met them, fiercely reprimanded Lee, and himself took command until the troops were reformed. Then Lee resumed command and held his position until ordered to retreat, which he did in good order. Meanwhile Washington had brought up the main body and taken an advantageous position on an eminence with a wood behind and a marsh in front of him: from this position he kept up an effective cannonade on the enemy. The latter made desperate efforts to dislodge the Americans; first attacking their left; then turning against their right under Gen. Greene, where, protected by an orchard, Gen. Wayne was keeping up a harassing and destructive fire. In this attempt Col. Monckton was killed while charging at the head of his royal grenadiers. His troops were repulsed with heavy loss, and Wayne held his position. Finally the British fell back to where Lee had met them in the morning. The Americans could not follow up their advantage, because of fatigue and the excessive heat. During the night Clinton made a hasty and silent retreat, and so escaped. The heat was so intense that many died during the day from its effects alone, the American troops especially being weakened by their terrible privations and suffering during the previous winter at Valley Forge. The loss of the Americans was 69 killed and 160 wounded. Of the British there were nearly 300 killed and 100 wounded and prisoners. After the battle Washington had Gen. Lee court-martialed on the ground of cowardice, and suspended from his command for one year.

MONMOUTH.

MONMOUTH, JAMES, Duke of: reputed natural son of Charles II.: 1649, Apr. 9—1685, July 15; b. Rotterdam. His mother, Lucy Walters, according to Evelyn, a 'browne, beautiful, bolde, but insipid creature,' came to England with her son 1656, during the Commonwealth. She is said to have been treated as though she had been the king's wife, and was committed to the Tower; but was soon allowed to retire to France, where she died. Charles sought out the boy, and committed him to the care of Lord Crofts, who gave him his own name. On the restoration, M., then 'Mr. James Crofts,' went to England with the queen-dowager, and was handsomely lodged at Hampton Court and Whitehall. These honors were, in after years, referred to by his followers as justifying their belief that he was indeed the king's legitimate son; though doubt has been cast on the statement that M. was even the king's natural son, in view of the fact that Lucy Walters had previously lived with Robert Sidney. The king however always claimed him and seemed fond of him. A wealthy heiress, Anne, daughter of the Earl of Buccleuch, was selected for his wife; and before he had completed his sixteenth year, he was married to her, and was created Duke of Monmouth. About the year 1670, Shaftesbury put M. forward as the head of the popular party, and rival of the Duke of York (afterward James II.). At the period of the Titus Oates' plot (1678), rumors that the 'Protestant Duke' was indeed the king's legitimate son spread far and wide. The Duke of York was compelled to quit the kingdom; and parliament brought forward a bill for excluding him from the succession, when Charles suddenly dissolved it. A document was at the same time issued by the king, solemnly declaring that he had never been married to Lucy Walters. M. was sent into Scotland, 1679, to quell the rebellion. He defeated the Covenanters at Bothwell Bridge; but his humanity to the fleeing and wounded was so conspicuous, and his recommendations to pardon the prisoners were so urgent, as to bring on him the violent censures of the king and Lauderdale. He thus became the favorite of the English nonconformists; though, according to Pepys, he had, years before, established a character for youthful vice and profligacy. He had indeed become noted for beauty of person and emptiness of mind. The return of the Duke of York, and the exile of M., soon followed. In Holland, he allied himself to the leaders of the nonconformist party, exiled like himself; and when he was allowed to return to London, he was received with such demonstrations of joy, that M. felt that he was the people's choice. In truth there was such widespread terror as to the accession to the throne of the king's Rom. Cath. brother, that M.'s possible claim was eagerly seized upon, and was even urged by Shaftesbury. In 1680, he made a semi-royal progress through the west of England, with the design, probably, of courting the nonconformists, who were more numerous there than in any other part of the country, except London and

Essex. In 1682, he traversed some of the n. counties. The king and his brother were alarmed; and M. was arrested at Stafford, and bound over to keep the peace. He meanly confessed his participation in the Rye-House plot, accusing himself and others of a design to seize the king's person, and subvert his government. The king pardoned him on his solemn promise to be a loyal subject to the Duke of York, in case the latter should survive the king. In 1684, M. fled to Antwerp, and remained abroad until the death of the king, when he resolved to embark for England. He landed 1685, June 11, at Lyme-Regis, and issued a manifesto declaring James to be a murderer and usurper, charging him with introducing popery and arbitrary power, and asserting his own legitimacy and right by blood to be king of England. He was received with great acclamations at Taunton, where he was proclaimed as James II. At Frome, he heard the news of the defeat of Argyle, who, at the head of the Scottish exiles, had attempted to raise an insurrection in Scotland. Money and men were now abundant; but arms were wanting, and thousands of those who had flocked to him went home for lack of them. July 5, he was persuaded, with only 2,500 foot and 600 horse, to attack the king's forces, which, under the command of the Earl of Faversham, were encamped at Sedgemoor, near Bridgewater. M.'s troops were unable to cross a running stream or wide ditch which protected the camp, and were mowed down by the king's artillery. Their ammunition soon failed; and M. having set a cowardly example of flight, his troops were slaughtered like sheep. About 300 of M.'s followers fell in the battle; but 1,000 were massacred in the pursuit. M. was found concealed in a ditch, and was brought to London. He made the most humiliating submissions, and obtained a personal interview with James. 'He clung,' says Macaulay, 'in agonies of supplications round the knees of the stern uncle he had wronged, and tasted a bitterness worse than that of death, the bitterness of knowing that he had humbled himself in vain.' Even his prayer for 'one day more,' that he might 'go out of the world as a Christian ought,' was brutally refused. June 15, he was brought to the scaffold, and beheaded on Tower Hill; the executioner performing his office so unskilfully that five blows were struck before the head was severed. M. met his death with calmness. The 'Bloody Assize' afterward commenced under Judge Jeffreys, when M.'s adherents paid a fearful penalty for their participation in his rash and ill-advised rebellion.

MONO-, *mōn'ō*:- a prefix: see MON.

MONO, n. *mō'nō* [native name in Guatemala]: *Mycetes villosus*, the black howler, a black monkey with a voice which may be heard two miles off. The Indians eat its flesh. It is found in forests from East Guatemala to Paraguay.

MONOBASIC--MONOCLE.

MONOBASIC, a. *mǒn'ō-lā'zīk* [Gr. *monos*, alone; *basis*, a base]: in *chem.*, requiring only one molecule of base to one of the acid to form a neutral salt, thus nitric acid is monobasic; in *bot.*, applied to a root reduced to a small unbranched portion, as though it formed merely the base of the stem.

MONOCARDIAN, a. *mǒn'ō-kâr'dī-ăn* [Gr. *monos*, alone; *kardīă*, the heart]: having a single heart, that is, one consisting of a single auricle and ventricle, as fishes: N. an animal having a single heart.

MONOCARPON, n. *mǒn'ō-kâr'pōn* [Gr. *monos*, alone; *karpos*, fruit]: in *bot.*, a plant bearing fruit but once and then perishing; an annual plant. **MON'OCAR'POUS**, a. *-kâr'pūs*, or **MON'OCAR'PIC**, a. *-kâr'pīk*, bearing fruit but once and then perishing, as wheat, oats, etc. **MON'OCAR'PIÆ**, n. plu. *-pī-ē*, plants which bear fruit once and then perish.

MONOCEPHALOUS, a. *mǒn-ō-sěf'a-lūs* [Gr. *monokephalos*]: in *science*, having one head, but two distinct, or sometimes blended, bodies: in *bot.*, having a single head of flowers.

MONOCEROUS, a. *mǒ-nōs'ēr-ūs* [Gr. *monos*, alone; *keras*, a horn, a tusk]: having only one horn or tusk.

MONOCHLAMYDEOUS, a. *mǒn'ō-klām-īd'ē-ūs* [Gr. *monos*, alone; *chlamus* or *chlam'uda*, a military cloak, a scarf]: in *bot.*, having a single floral envelope or covering, which is the calyx.

MONOCHORD, n. *mǒn'ō-kawrd* [Gr. *monos*, alone; *chordē*, a gut or string]: musical instrument constructed to exhibit the mathematical proportions of musical intervals. It consists of a flat board four or eight ft. long, better 16 ft. where space can be spared. The breadth of the board is according to the number of the strings, from two to six. The board is covered with fine white paper. A straight line is drawn from end to end below each string, and each line is accurately divided into the different proportions into which the full length of the string, as a fundamental sound, harmonically divides itself: see **HARMONICS**. The string is fixed at one end, and rests on a bridge; while at the other end, where it also rests on a bridge, it is stretched by a tuning-peg, or by a weight. The sounds from the strings are produced by a violin-bow. The M. is used chiefly in illustrating acoustical experiments in the proportion of intervals and temperament.

MONOCHROME, n. *mǒn'ō-krōm* [Gr. *monos*, alone; *chroma*, color, complexion]: a painting in its tints, tones, and shades of only one color. **MON'OCHROMAT'IC**, a. *-măt'ik*, consisting of one color; exhibiting light only of one color.

MONOCLE, n. *mǒn'ō-kl* [F. single eye-glass; OF. *monocle*; L. *monoculus*, one-eyed]: animal with one eye; eye-glass for one eye.

MONOCLINATE—MONOCYSTIC.

MONOCLINATE, a. *mō-nōk'ŭ-nāt* [Gr. *monos*, alone; *klinō*, I bend]: having one of the axes obliquely inclined; in *min.*, applied to certain crystals. **MONOCLINOUS**, a. *mō-nōk'ŭ-nūs*, in *bot.*, having both stamens and pistils in every flower. **MONOCLINAL**, a. *mōn'ō-klī'nāl*, in *geol.*, applied to strata that dip for an unknown length in one direction. **MONOCLINIC**, a. *mōn'ō-klīn'ik*, applied to a system of crystallization in which the crystals have three unequal axes, two of which intersect each other at an oblique angle, and are cut by the third at right angles; also called **MONOCLINOHEDRIC**, a. *mōn'ō-klīn-ō-hēd'rīk* [Gr. *hedra*, a seat].

MONOCOTYLEDON, n. *mōn'ō-kōt'ŭ-lē'dōn* [Gr. *monos*, alone; *kotylēdon*, the hollow of a cup, cup-shaped]: a plant with only one cotyledon or seed-lobe, as in oats or wheat. **MON'OCOT'YLE'DONOUS**, a. *-lē'dō-nūs*, having only one cotyledon or seed-lobe.

MONOCOTYLE'DONOUS PLANTS: plants in which the embryo has one and only one Cotyledon (q.v.). The cotyledon in these plants varies extremely in form, and is often comparatively of great size, but has always a slit, from which, as germination takes place, the gemmule sprouts. The gemmule in elongating assumes an acuminate shape. M. P. all are Endogenous (q.v.); except the Dictyogens (q.v.), in which the endogenous structure is not perfectly exhibited. They are also *endorhizal* [Gr. *endon*, within; *rhiza*, a root]; that is, the radicle is covered with a cellular sheath, and gives rise to fibrils similar to itself in structure. The leaves are generally sheathing at the base, and there embrace the stem; they also generally have simple parallel nerves connected by cross veins, the leaves of dictyogens alone being reticulated. The number of the parts of the flower is generally three, or a multiple of three. The floral envelopes, often splendid, as in lilies, tulips, etc.—are generally united as a Perianth (q.v.), instead of forming a distinct calyx and corolla. The principal natural orders of M. P. are Grasses, *Cyperaceæ*, Palms, Orchids, *Scitamineæ*, *Musaceæ*, *Liliaceæ*, and *Iridaceæ*. The general appearance of these plants distinguishes them almost as perfectly as any structural characters.

Of the fossil remains of the vegetable kingdom, the smallest portion consists of M. P., both acotyledonous and dicotyledonous plants being much more abundant.

MONOCRACY, n. *mōn-ōk'rā-sī* [Gr. *monos*, alone; *kratēō*, I govern]: government by a single person. **MON'OCRAT**, n. *-krāt*, one who rules alone.

MONOCULAR, a. *mōn-ōk'ū-lēr*, or **MONOC'ULOUS**, a. *-lūs* [Gr. *monos*, alone; L. *oc'ŭlus*, the eye]: one-eyed; suited for one eye, as an ordinary microscope. **MONOCULE**, n. *mōn'ō-kūl*, a one-eyed insect.

MONOCYSTIC, a. *mōn'ō-sīs'tīk* [Gr. *monos*, one; *kustis*, a bag, a bladder]: consisting of only one cell or cavity; **unilocular**.

MONOD—MONODACTYLOUS.

MONOD, *mo-nod'*, ADOLPHE FRÉDÉRIC THEODORE: French Prot. clergyman: 1802, Jan. 21—1856, April 6; b. Copenhagen, whither his father, Jean M., pastor of the Reformed Church in Paris, had removed at the outbreak of the French Revolution. He was the second son (bro. of Frédéric M.) of an eminent family; was educated at the Coll. Bonaparte, Paris; studied theology at Geneva (to 1824); visited Italy and preached 1825–27 to a small Prot. congregation at Naples; returning to France was appointed pastor of the Reformed Church in Lyons, and made so strong an impression that, though himself removed on account of objection to his evangelical fervor and orthodox views of the person and mission of Christ, the church soon grew out of its small private meeting-place into a spacious chapel; and 30 years later, where he had begun alone, there were four evangelical pastors, many evangelists, and eight chapels. In 1838 he was appointed by the govt. prof. of theology at Montauban, and filled the office 11 years, travelling meanwhile in s. France, preaching and giving Bible instruction of great interest and power. In 1849 he succeeded his elder brother at the Oratoire in Paris, by appointment of the consistory and govt. confirmation. His eloquence, spiritual power, sympathetic and cultivated mind, refined character, and gift of imagination gave him remarkable success, both in the pulpit and in Bible instruction. He died suddenly, in Paris. Besides a volume of sermons, 1844, he published *Lucile, ou la Lecture de la Bible*; *La Femme*; and *Saint Paul*.

MONOD', FRÉDÉRIC JOEL JEAN GERARD: French Prot. clergyman: 1794, May 17—1863; b. Monnaz near Morges, Switzerland, eldest son of Jean M., and brother of Adolphe M. He was educated at Geneva, entered the ministry 1820, was pastor of the Oratoire in Paris more than 12 years, after his father's death; established 1824, and edited until his death, the *Archives du Christianisme*; united with Count de Gasparin, Edouard de Pressensé, and others in seeking to restore in the national (Prot.) church a rule of faith making rationalism inconsistent with membership; and not succeeding, took a leading part in organizing a Free Church of France based on belief in the divine mission and person of Christ. As preacher, lecturer, and Free Church leader his influence and reputation were very great. He visited America 1858, and was cordially received. His admiration of American institutions was extreme, and during the civil war he was one of the originators of an address signed by the majority of French ministers, earnestly deprecating the overthrow of the Union.—A son, Jean, became theol. prof. at Montauban 1865.

MONODACTYLOUS, n. *mōn'ō-dāk'tīl-ūs* [Gr. *monos*, alone; *dak'tulos*, a finger or toe]: having only one finger or toe.

MONODELPHIA—MONOGASTRIC.

MONODELPHIA, n. plu. *mŏn'ō-dēl'fī-ă* [Gr. *monos*, alone, single; *delphus*, a womb]: the division of mammals which have the uterus single, including all except the monotremes and marsupials. **MONODELPHOUS**, a. *mŏn'ō-dēl'fūs*, resembling the Monodelphia, as in bringing forth the young completely formed; in *bot.*, having all the filaments united so as to form a single bundle around the style.

MONODICHLAMYDEOUS, a. *mŏn-ōd'ī-klām-īd'ē-ūs* [Gr. *monos*, one; *dis*, twice; *chlamus*, a cloak or tunic]: in *bot.*, having either one or both floral envelopes.

MONODON, n. *mŏn'ō-dŏn* [Gr. *monos*, alone; *odous* or *odonta*, a tooth]: the narwhal or sea-unicorn: see **NARWHAL**.

MONODY, n. *mŏn'ō-dī* [Gr. *monos*, alone; *ōdē*, a song]: a poem or song chanted or sung by a single person, and in which he is supposed to bewail himself; a lament; a dirge. **MONODICAL**, a. *mō-nōd'ī-kāl*, pertaining to a monody. **MON'ODIST**, n. *-dīst*, a writer of monodies.

MONŒCIA, n. *mŏn-ē'shī-ă* [Gr. *monos*, one; *oikos*, a house]: a class of plants having the stamens and pistils in distinct flowers on the same plant. **MONŒCIAN**, a. *-shī-ăn*. **MONŒCIOUS**, a. *-shī-ūs*, in *bot.*, having the male and female parts of fructification (*stamens* and *pistils*) in different flowers, but upon the same plant. Such plants and their flowers are said to be *monœcious*. Monœcious plants form one of the classes of the Linnæan artificial system, but many occasional instances of monœcious species are found in genera belonging to other classes. Monœcious plants often have the flowers in catkins, sometimes the male flowers only; and often in spikes, the male flowers sometimes occupying the upper, sometimes the under part of the same spike with the female flowers, and sometimes distinct spikes upon the same plant. Common examples of monœcious plants are the hop, box, birch, beech, alder, oak, and hazel. **MONŒCISM**, n. *mŏ-nē'sīzm*, the condition where unisexual flowers are produced on different branches.

MONOGAMIA, n. plu. *mŏn'ō-gā'mī-ă* [Gr. *monos*, one, single; *gamos*, marriage]: a general name for plants which have their anthers united but their flowers not compound. **MONOGAM**, n. *mŏn'ō-gām*, a plant having a simple flower though the anthers are united.

MONOGAMY, n. *mŏn-ōg'ă-mī* [Gr. *monogamīă*—from *monos*, alone; *gamos*, marriage, wedlock]: the marriage of one wife only; the condition or restraint of not marrying a second wife after the death of the first; the opposite of *polygamy*. **MONOG'AMIST**, n. *-ă-mīst*, one who disallows second marriages. **MONOG'AMOUS**, a. *-ă-mūs*, having one wife only, and not permitted to marry a second wife after the death of the first; as applied to animals, abiding by one female, as the dove.

MONOGASTRIC, a. *mŏn'ō-gās'trīk* [Gr. *monos*, one; *gastēr*, the belly]: having only one stomach.

MONOGENESIS—MONOGRAM.

MONOGENESIS, n. *mŏn-ō-jĕn'ĕ-sĭs* [Gr. *monos*, alone, single; *genesis*, origin]: term used by Van Beneden to denote direct development of an embryo from a parent similar to itself. Prof. A. Thomson applies the term to the descent of an individual from one parent form, containing both the sperm cell and germ cell; monogony. Haeckel also uses it in this sense. **MONOGENISM**, n. *mŏnj'ĕn-ĭzm* [F. *monogénisme*]: system which assumes that all men are descended from a single pair. **MONOG'ENIST**, n. *-ĭst* [F. *monogéniste*]: supporter of monogenism. Huxley divides them into three classes: (1) 'Adamites' who accept the Mosaic account of the creation literally; (2) those who occupy a middle position between the 'Adamites' and the 'Rational Monogenists'; (3) 'Rational Monogenists,' including Linnæus, Buffon, Blumenbach, Cuvier, and Pritchard. Their views are that the present condition of the earth has existed for untold ages; that at an extremely remote period man was created somewhere between the Caucasus and the Hindu Koosh; that as men multiplied they migrated; and that climatic influences and other conditions are sufficient to account for all the diversities of mankind. **MONOG'ENY**, n. *-ĭ*, tenet that mankind sprang from a single pair. See **ETHNOLOGY**.

MONOGRAM, n. *mŏn'ō-grām* [Gr. *monos*, alone; *gramma*, a letter]: a cipher, or a single device, formed by the intertexture of two or more letters; the private mark of an artist. **MON'OGRAM'MAL**, a. *-māl*, or **MON'OGRAM'MIC**, a. *-mĭk*, resembling or pertaining to a monogram.

MON'OGRAM: a character or single device composed of two or more letters of the alphabet, often interlaced with other lines, and used as a cipher or abbreviation of a name. A perfect M. is one in which all the letters of the word are to be traced. The use of monograms began at a very early date. They are found on Greek coins, medals, and seals, and are particularly numerous on the coins of Macedonia and Sicily. Both on coins and in mss., it was the practice to represent the names of states and cities by monograms, of which more than 500 are known, but some have not been deciphered. Monograms occur on the family coins of Rome, but not on the coins of the earlier Roman emperors. Constantine placed on his coins one of the earliest of Christian monograms, which is to be traced in the recesses of the catacombs, composed of the first and second letters of the Greek *Χριστος* (Christus), a M. which also appeared on the *Labarum* (q.v.), and was continued on the coins of the succeeding emperors of the East to Alexander Comnenus and Theodorus Lascaris. We often find it combined with the first and last letters of the Greek alphabet (Rev. i. 8), as in Fig. 1. Another well-known M. is that of the name of Jesus, *IHS*, from the first three letters of the Greek *Ιησους* (Iesous).

Popes, emperors, and kings of France during the middle ages were in the practice of using a M. instead of

MONOGRAM.

signing their names. Almost all the coins of the French kings of the Carlovingian race bear their respective monograms, as also do those of Alfred and some other Saxon



Fig. 1.

kings of England. Fig. 2. represents that of Charlemagne, a perfect M., in which all the letters of *Karólus* can be traced.

Painters and engravers in Germany and Italy have used monograms to a large extent as a means of distinguishing their works. In these, the initial letters of their names were often interwoven with figures of a symbolical character, to form a rebus on the artist's name. Fig. 3 is the M. of Albert Dürer; Fig. 4, of Ludger zum Ring. The first typographers distinguished their publications by wood-cut vignettes, whose invention is ascribed to the elder Aldus; but besides these, each made use of a M. or cipher, a series of which, well known



Fig. 2.

to the bibliographer, fixes the identity of the ancient editions, German, Italian, and English, from the inven-



Fig. 3.



Fig. 4.



Fig. 5.



Fig. 6.

tion of printing till the middle or end of the 16th c. Fig. 5 is the M. of Andrea Turresano d'Asola, father-in-law of Aldus Manutius; Fig. 6, of Luca Antonio Giunta,



Fig. 7.

famous printer of Venice between 1489 and 1500; Fig. 7, of William Caxton. For a detailed account of the monograms of early printers and others, see Brulliot, *Dictionnaire des Monogrammes* (Munich 1832-34); Horne's *Introduction to Bibliography*, II.; and Herbert and Ames's *Typographical Antiquities*.

MONOGRAPH—MONOMANIA.

MONOGRAPH, n. *mǒn'ō-grăf* [Gr. *monos*, alone; *graphō*, I write]: treatise or description limited to a single thing or object, or to a single branch of a subject. Monographs are entirely of recent date, and have contributed much to the progress of science. In botany especially, monographs of orders and genera are very numerous; and some are among the most splendid and sumptuous of scientific works. **MONOGRAPHER**, n. *mǒn-ōg'rá-fér*, or **MONOGRAPHIST**, n. *-físt*, a writer of monographs. **MONOGRAPHIC**, a. *-grăf'ík*, or **MONOGRAPHICAL**, a. *-grăf'íkăl*, of or pertaining to a monograph. **MONOGRAPHICALLY**, ad. *-lǐ*. **MONOGRAPHY**, n. *mǒn-ōg'rá-jǐ*, the art or practice of writing monographs; description or representation simply by lines without colors.

MONOGYNIA, n. *mǒn'ō-jǐn'ĩ-ă* [Gr. *monos*, alone; *gynē*, a female, a woman]: an order of plants, including such as have only one pistil or stigma in a flower. **MONOGYN**, n. *mǒn'ō-jǐn*, a plant having only one pistil. **MONOGYNIAN**, a. *-jǐn'ĩ-ăn*, or **MONOGYNOUS**, a. *mǒn-ōj'ĩ-nūs*, having only one pistil or stigma in a flower; also applied to plants having one style. **MONOGYNÆCIAL**, a. *mǒn'ō-jǐn-ē'shǐ-ăl* [Gr. *oikḗ*, a house]: in *bot.*, applied to simple fruits formed by the pistil of one flower.

MONOHEMEROUS, a. *mǒn-ō-hēm'ér-ūs* [Gr. *monos*, alone, single; *hēmera*, a day]: in *med.*, existing or continuing for a single day.

MONOLITH, n. *mǒn'ō-lǐth* [Gr. *monos*, alone; *lithos*, a stone]: pillar, column, monument, obelisk, statue, or other structure, consisting of a single stone: in India are monolithic temples entirely cut out of the solid rock. **MONOLITHIC**, a. *-lǐth'ík*, or **MONOLITHAL**, a. *-ăl*, consisting of a single stone.

MONOLOGUE, n. *mǒn'ō-lǒg* [F. *monologue*, one that loves to hear himself talk—from Gr. *monologos*, speaking alone—from *monos*, alone; *logos*, speech]: a speech or poem uttered by a person alone; a soliloquy. **MONOLOGIST**, n. *mǒn-ōl'ō-jǐst*, a writer or performer of monologues. **MONOLOGY**, n. *-jǐ*, the habit of soliloquizing, or of monopolizing conversation.

MONOMANIA, n. *mǒn'ō-mă'nǐ-ă* [Gr. *monos*, alone; *manḗ*, madness]: a mental disease in which madness exists on one particular subject, or a limited number of subjects, while the mind is measurably lucid on others. **MONOMANIAC**, n. *-nǐ-ăk*, one affected with monomania: **ADJ.** affected with monomania. **MONOMANIACAL**, a. *-mă-nǐ-ă-kăl*, having the character of monomania, or affected with it.—**SYN.** of 'monomania': madness; mania; insanity; derangement; alienation; aberration.

MONOMANIA.

MONOMANIA: term loosely used to denote every form of partial insanity; but properly defined as that mental condition in which a single faculty, or class of faculties or associations, becomes diseased, the mind in its general activity remaining healthy. Slight and solitary aberrations, e.g., where a strong antipathy to cats co-exists with a love for human kind, or where there appears an incontrollable tendency to steal, to squander, to drink, to destroy, are frequent, and are supposed to be compatible with the exercise of intelligence, and with the discharge of many of the ordinary duties of life. By a more strict limitation, the term M. has been confined to such affections as involve the emotions and propensities alone. It is, however, held that the whole mind, notwithstanding its apparent integrity, is involved or influenced by the presence of such morbid conditions, at least while they are predominant. It is undoubtedly difficult to point out in what manner the belief, e.g., that a particular organ has been transmuted into glass, can interfere with or render the memory, or the power of instituting comparisons, defective and untrustworthy; yet it is legitimate to receive with caution every manifestation of powers so constituted that they fail to detect the incongruities and absurdities with which they are associated; or, having detected the real character of these errors, are unable or unwilling to cast them out, or to disregard them. There is much countenance given to this theory by facts which indicate that even trivial forms of mental obliquity are connected with an unsound organization; and that particular and rarely recognized monomanias are invariably associated with the same structural alteration. The unhealthy elevation of the sentiment of cautiousness, for example, especially where it amounts to fear of death, panic, or panphobia, is a symptom of disease of the heart and large blood-vessels; while the monomania of ambition, or optimism, as it has been styled, is the concomitant of the general paralysis of the insane. It will be obvious, from the previous definitions, that the species or varieties of monomania must correspond to the faculties or phases of the human mind, and to their combinations. Several great divisions, however, have been signalized, both on account of their frequency and of their influence on the individual and on society. 1. Monomania of Suspicion, comprehending doubts in the fidelity and honesty of friends and those around, belief in plots and conspiracies, the dread of poison; and where, as is often the case, it is conjoined with cunning, the propensity to conceal, mystify, and deceive: this malady has frequently been observed in intimate connection with cancer and malignant growths. 2. Monomania of Superstition and Unseen Agencies, where credulity, mingled with religious awe, peoples the external world with spectres, omens, mysteries; and the imagination with horrors or ecstatic reveries: insensibility to pain, or indifference to external injuries, has been observed as a characteristic of individuals affected with this disease.

MONOME—MONOPATHY.

3. Monomania of Vanity, or Euphoria, where display and ostentation are indulged, without reference to the position and means of the patient. 4. Monomania of Fear. 5. Monomania of Pride and Ambition; egotism developed to an insane degree—doubtless far more common than is supposed, since it is sometimes curiously concealed; in many cases indicative of the approach of an insanity that will cloud the whole mind. 6. Kleptomania (q.v.). 7. Dipsomania (q.v.). If it can be proved that such morbid tendencies as have been here mentioned, and others less prominent, are merely salient points of a great breadth and depth of mental disease, the plea of insanity may justifiably be employed more frequently in the consideration of criminal acts.—Esquirol, *La Monomanie*; Bayle, *Maladies du Cerveau*; Stephens's *Criminal Law of England*, p. 92.

MONOME, n. *mŏn'ŏm*, or MONOMIAL, n. *mŏn-ŏ'mĭ-ăl* [Gr. *monos*, alone; *onoma*, a name]: in *alg.*, a quantity or expression of one term only, as *2ab*.

MONOMETALLISM, a. *mŏn-ŏ-mĕt'al-ĭzm* [prefix *mono-*; Eng. *metal*; *-ism*]: the fact or principle of having only one metal (e.g., gold) as a standard for coinage; belief in the advantages of a single metallic standard: see BIMETALLISM: MONEY: ETC. MONOMETAL'LIST, n. *-ĭst*, one who advocates monometallism.

MONOMETER, n. *mŏn-ŏm'ĕ-tĕr* [Gr. *monos*, alone; *metron*, a measure]: a rhythmical series consisting of a single metre. MON'OMET'RIC, a. *-rĭk*, having the axes equal or similar, said of certain systems of crystallization.

MONOMIAL: see MONOME.

MONOMORPHOUS, a. *mŏn'ŏ-mŏr'fŭs* [Gr. *monos*, alone; *morphē*, form]: having but a single form—said of insects which, in their larval state, are nearly the same as in the perfect condition, except as regards wings.

MONOMYARIA, n. plu. *mŏn'ŏ-mĭ-ă'rĭ-ă*, or MON'OMY'ARIES, n. plu. *-mĭ'ă-rĭz* [Gr. *monos*, single; *mus*, a muscle]: a term employed to distinguish those bivalves whose shells are closed by a single adductor muscle, such as the oysters and clam-shells. MON'OMY'ARY, n. *-mĭ'ă-rĭ*, a bivalve of the order *Monomyaria*: ADJ. having but one muscle for closing the shell.

MONONGAHELA, *mŏ-nŏn-ga-hĕ'la*, RIVER: stream rising in the Alleghany Mountains in Va., flowing n. into Penn., and uniting with the Alleghany at Pittsburg to form the Ohio; length 300 m. It is navigable for steamboats to Brownsville, 60 m. above Pittsburg, with dams and locks for low water. Vast seams of coal open on its high banks, from which flat boats are loaded, and floated down with the current through the Ohio and Mississippi.

MONOPATHY, n. *mŏn-ŏp'ă-thĭ* [Gr. *monos*, alone; *pathos*, suffering]: solitary suffering or sensibility.

MONOPETALOUS—MONOPHYSITE

MONOPETALOUS, a. *mōn'-o-pet'-ā-lūs* [Gr. *monos*, alone; *pet'alon*, a leaf]: having the corolla in one piece, formed by the union of several petals, cohering so as to form a tube; gamopetalous.

MONOPHONIC, a. *mōn'-ō-fōn'īk* [Gr. *monos*, alone, single; *phōnē*, sound]: in *mus.*, a term applied to a composition having but one part; single-voiced.

MONOPHTHONG, n. *mōn'-ōf-thōng* [Gr. *monos*, alone; *phthonggos*, a sound]: a simple vowel-sound; two vowels pronounced as one. **MON'OPHTHON'GAL**, a. consisting of a simple vowel-sound.

MONOPHYLETIC, a. *mōn'-ō-fī-lēt'īk* [Gr. *monos*, alone, single; *phulē*, a tribe, a family]: of or pertaining to a single family. **MONOPHYLET'IC HYPOTH'ESIS**, n. the hypothesis of descent which endeavors to trace the origin of all individual groups of organisms to a single common species of Moneron, which originated by spontaneous generation; opposed to Polyphyletic.

MONOPHYLLOUS, a. *mōn'-ōf'īl-lūs* or *mōn'-ō-fīl'lūs* [Gr. *monos*, alone; *phullon*, a leaf or blade]: one-leaved; in *bot.*, monosepalous; having an involucre composed of a single piece.

MONOPHYDONT, n. *mōn'-ō-fī'ō-dōnt* [Gr. *monos*, single; *phūō*, I generate; *odontes*, teeth]: a mammal which has only one set of teeth.

MONOPHYSITE, n. *mōn'-ōf'ī-sīt* [Gr. *monos*, alone; *phusis*, nature]: one who maintains that Christ had one nature only, the human and divine united in one. The Monophysites were a widely ramified sect of the ancient church who held that Christ has only *one* nature, the human nature absorbed into the divine. Monophysite views were first decidedly put forward in the controversy against Nestorius. Cyril having expressed the opinion that the flesh of the Logos was essential to his personality, the archimandrite Eutyches (q.v.) went on to assert a deification or apotheosis of the flesh of Christ, and obtained the consent of a synod at Ephesus, 449, commonly called the 'Synod of Robbers,' to this doctrine (see **EPHESUS, COUNCILS OF**); but he and his adherents (at first called after him **EUTYCHIANS**) were condemned as heretics by the Council of Chalcedon (q.v.) two years later. It was after this council that the name *Monophysites* began to be used. The decision of the council, however—viz., that in Christ *two* natures, neither interfused, changed, nor divided, were united in *one* person, and constituted *one* hypostasis—was not adapted to allay, but rather to increase discord. Accordingly, the strife grew hotter. The Asiatic and Egyptian clergy, strongly opposed to Nestorianism, were generally inclined to Monophysite views, and received countenance from Emperor Basiliscus. After long and often bloody contests between the supporters of the opposite opinions, the Monophysites formally separated from the orthodox church. This separation took place in the first half of the 6th c.,

MONOPLAST—MONOPODIA.

when the imperial protection hitherto bestowed on them was lost by the alliance of the emperors Justin and Justinian with the Latin Church. Besides, they had not maintained unity among themselves. As early as 482, when Emperor Zeno published his famous *Menoticon*, or formula of concord, it was accepted by several of the more moderate Monophysites. This roused the indignation of the extremest sectaries; they renounced fellowship with their laxer brethren, and formed a sect of their own. They were called *Akephaloi*, and formed the *ultras* among the Monophysites. Controversies arose also in 519 on the question, whether or not the body of Christ was corruptible. The Severians—adherents of Severus, deposed bishop of Antioch—affirmed that it was; the Julianists, or Gajanites, followers of Bp. Julianus or Gajanus, denied it. The former were consequently called (Gr.) *Phthartolatrists*, (Lat.) *Corrupticolæ* (Worshippers of the corrupt); the latter, *Aphthartodocetæ* (Believers or Teachers of Incorruption), and sometimes—as an incorruptible body could be only apparent, and not real—*Phantasiasts*. The *Aphthartodocetæ* split again on this other point—whether or not Christ's body was created; the *Aktistetoi* (Gr. *ktizō*, to create) asserting that it was not created, and the *Ktistolatrists*, that it was. The Severians, called also, after one of their bishops, *Theodosians*, finally got the upper hand, and excommunicated their opponents, including another sect, the *Agnoetoi*, who denied that Christ as a man was omniscient. About 560, the Monophysite Askusnages, and after him the Christian philosopher Philoponus, ventured to speak of the Three Persons in the Godhead as Three Gods. This, however, was reckoned heretical even by the Monophysites themselves, and was the occasion of a large recession to the bosom of the Catholic Church. Monophysite communities continued strongest in Egypt, Syria, and Mesopotamia, where they maintained a regular ecclesiastical order under their own patriarchs of Alexandria and Antioch; and after the Syrian, Jakob Baradaeus (Al-Baradai, died about 578), had drawn up for them an ecclesiastical constitution, they formed the independent churches of the *Jacobites* and *Armenians*. See JACOBITE CHURCH: ARMENIAN CHURCH: EUTYCHES. The Coptic and Abyssinian churches also are Monophysite in doctrine.

MONOPLAST, n. *mŏn'ō-plăst* [Gr. *monos*, one; *plastos*, formed]: a naked non-vesicular body; an animal cell destitute of envelope. **MONOPLASTIC**, a. *mŏn'ō-plăst'īk*, having one primary form.

MONOPODIA, n. *mŏn'ō-pō'dī-ă* [Gr. *monos*, one; *pous* or *poda*, a foot]: a monstrosity having one foot only. **MON'OPŌ'DIUM**, n. *-pō'dī-ŭm*, in bot., an elongated axis giving off lateral structures having a similar nature. **MON'OPŌ'DIAL**, a. *-pō'dī-ăl*, applied to an indefinite or centripetal inflorescence; racemose.

MONOPOLI—MONOPOLY.

MONOPOLI, *mō-nōp'ō-lē*: town of s. Italy, province of Bari, on the Adriatic coast, in a pleasant and healthful plain, 28 m. e.s.e. of Bari. It is supposed to be of Grecian origin, the name in Greek signifying the *solitary city*. It is surrounded by walls, and has a fortress constructed 1552 by Charles V. The neighboring territory yields an immense quantity of olive-oil. Pop. of M. abt. 14,000.

MONOPOLIZE, v. *mō-nōp'ō-līz* [F. *monopoliser*; Sp. *monopolizar*, to monopolize—from L. *monopolium*; Gr. *monopolion*, the right of monopoly—from Gr. *monos*, alone; *pōlēō*, I sell]: to get the exclusive right of selling; to purchase or obtain possession of the whole of anything with the view of selling at an advanced price and controlling the market; to obtain or engross the whole. **MONOPOLIZING**, imp.: **ADJ.** obtaining the sole power or right; engrossing. **MONOPOLIZED**, pp. *-līzd*. **MONOPOLIZER**, n. *-lī-zēr*, or **MONOPOLIST**, n. *-līst*, one who has obtained the exclusive power to trade in a certain article, or who, by buying up the whole of it, has the command of the market at some place. **MONOPOLY**, n. *mō-nōp'ō-lī*, the possession of exclusive dealing in the sale of an article, which may be held by right of purchase, by patent, or simply by means of its superior manufacture; formerly a grant from the crown of the right of exclusive trading in some article.

MONOPOLY: limitation to one or more persons of the right or power to conduct business as a trader. It is generally used in a bad sense to express something injurious, but economic science has lately very much narrowed the field over which its injurious character is supposed to extend. In the first place, to be injurious it must be created by force or in some unnatural way; if it come in the natural course of trade, it is generally beneficial. Thus, to a village where three or four traders have conducted a small lazy business, drawing large profits, there comes a capitalist, who sets up a large concern on the ready-money system, and, by selling good articles at a low rate, absorbs all the business. He is of course abused as a monopolist by the ineffective persons whom he has superseded; but his presence is a benefit to the community generally. If, however, he had gone to the village, not to compete with others, but with a government patent in his pocket securing to him the exclusive trade of the village, then, as he could sell at his own price, and make a fortune without trouble, he would of course be, like the old royal monopolists, a calamity to the people.

A careful distinction must be preserved between monopoly and property—that is to say, an exclusive right to *trade* must be separated from an exclusive right to *possess*—for, while the law of property exists, possession will always be exclusive. If, then, a particular trade can be conducted only with large capital, it must fall to those who either singly, or by co-operation, can com-

MONOPTERAL—MONOSPERMOUS.

mand that capital; and the answer to all complaints on the part of others is, that since capitalists can best serve the public in that particular, it is best for the public that capitalists should be allowed to do so.

A deal of legislation was wasted by our ancestors in Britain in enactments to prohibit people from creating monopolies by that fair competition which is now considered the true healthful development of trade. For some account of them and of their repeal, see **ENGROSSING**. When British trade was increasing in the 16th c., it found some old powers alleged to be inherent in the royal prerogative for conferring exclusive trading rights, which led to much oppression and loss. In Queen Elizabeth's parliament of 1597, a complaint was made that, for the benefit of favored courtiers, oppressive monopolies had been granted, not only for the sale of foreign luxuries, but for salt, leather, coal, and other articles of ordinary consumption. Queen Elizabeth said she 'hoped her dutiful and loving subjects would not take away her prerogative, which is the choicest flower in her garden, and the principal and head pearl in her crown and diadem.' Parliament returned to the charge, however, 1601, when, on the reading over of the list of monopolies, a theatrical scene was introduced by a member calling out: 'Is not bread among the number?' and on this producing a sensation, continuing: 'Nay, if no remedy is found, bread will be there before the next parliament.' In 1621, parliament took proceedings against Sir Giles Mompesson, charged with an oppressive use of his patent's monopoly. Four years afterward, an act was passed limiting this power in the crown. It leaves the right to grant only a limited monopoly in the manufacture of his invention to any inventor, and this is the origin of the present patent law: see **PATENT**.

MONOPTERAL, a. *mŏn'op'tér-ăl*, or **MONEPTERAL** [Gr. *monos*, alone; *pteron*, a wing]: one-winged; used to designate a temple without a cella, composed of columns arranged in an open circle and supporting a cupola or a conical roof.

MONOPTOTE, n. *mŏn'op-tôt* [Gr. *monos*, alone; *ptōtos*, fallen, or apt to fall]: in *gram.*, a noun having but one oblique case-ending.

MONORGANIC, a. *mŏn'ör-găn'ík* [Gr. *monos*, alone; *or'gānon*, an organ]: in *med.*, belonging to or affecting one organ, or a set of organs.

MONOSEPALOUS, a. *mŏn'ō-sĕp'ă-lūs* [Gr. *monos*, alone; *sepălon*, a sepal]: having the sepals which compose a calyx united at their edges or margins so as to form a tube; gamosepalous.

MONOSIS, n. *mŏ-nŏ'sīs* [Gr. *monos*, one, single]: in *bot.*, the isolation of an organ from the rest.

MONOSPERMOUS, a. *mŏn'ō-spér'mūs*, or **MONOSPERMAL**, a. *-măl* [Gr. *monos*, alone; *sperma*, seed]: one-seeded; applied to a fruit having only one seed. **MON'OSPERM**, n. *-spĕrm*, a plant of one seed only.

MONOSPHERICAL—MONOTHEISM.

MONOSPHERICAL, a. *mön'ō-sfēr'ī-kāl* [Gr. *monos*, alone; *sphaira*, a sphere or globe]: consisting of one sphere or globe.

MONOSTACHOUS, a. *mön-ös'tă-kūs* [Gr. *monos*, one; *stachus*, an ear or spike of corn]: in *bot.*, disposed or arranged in one spike only.

MONOSTICH, n. *mön'ō-stīk* [Gr. *monos*, alone; *stichos*, a verse]: a poem complete in one verse.

MONOSTOMUM, n. *mön-ös'tō-mūm*, **MONOS'TOMA**, n. plu. *-tō-mă* [Gr. *monos*, one; *stoma*, a mouth]: genus of trematoid worms, so called from having only a single sucker, which is situated anteriorly, and surrounds the mouth. It belongs to the *Trematoda Digenea* (of Van Beneden), all of which present the phenomena of alternation of generations, the earlier or larval forms occurring chiefly in mollusks, while the perfect worms are found, mostly, in vertebrated animals. Among the species of this genus occur *M. flavum*, found in waterfowl (the larva being the *Cercaria ephemera*, which is common in *Planorbis*, etc.), *M. mutabile*, found in various birds, and *M. lentis*. The last-named species derives its specific name from its having been found by Von Nordmann in a lens extracted in a case of cataract. Cobbold and other distinguished helminthologists are inclined to believe that this is not an independent species, but identical with the *Distoma ophthalmiobium* of Diesing.

MONOSTROPHIC, a. *mön'ō-strof'īk* [Gr. *monos*, alone; *strophē*, a turning]: not varied in measure; having one strophe only.

MONOSYLLABLE, n. *mön'ō-sil'lă-bl* [L. *monosyllăbus*, of one syllable—from Gr. *monos*, alone; *sullăbē*, a syllable]: a word of one syllable. **MON'OSYLLAB'IC**, a. *-lăb'īk*, consisting of words of one syllable.

MONOTESSARON, n. *mön-ō-tēs'sa-rōn* [Gr. *monos*, alone, single; *tessares*, four]: a harmony of the four gospels; a single narrative compiled from a collection of the four gospels.

MONOTHALMIC, a. *mön'ō-thăl'mīk* [Gr. *monos*, single; *thalămos*, a chamber]: in *bot.*, applied to fruits formed from one pistil. **MON'OTHAL'AMOUS**, a. *-thăl'ă-mūs*, one-chambered—applied to shells.

MONOTHECAL, a. *mön'ō-thē'kăl* [Gr. *monos*, single; *thēkē*, a sheath]: in *bot.*, having a single loculament.

MONOTHEISM, n. *mön'ō-thē-izm* [Gr. *monos*, alone; *Theos*, God]: doctrine of, or belief in, the numerical unity (*unus numero*) of the Godhead; or belief in and worship of only one living God. It is thus the opposite of *Polytheism* (q.v.). See **GOD**. The 'doctrine of the Trinity,' being thought by some to be incompatible with the monotheism taught by Jesus Christ, is therefore rejected by them as no part of his teaching: see **UNITARIANS**. While some theological statements of the Divine Trinity have not been sufficiently guarded on this point,

it is yet plain that a real belief in a Tri-unity in God (whether it be true or not) can be held with no approach to tritheism or to polytheism. Mohammedans and Jews hold the doctrine of the 'unity of God,' even more rigorously in some respects than modern Christians, at least they reject with vehemence the least approach to a Trinitarian conception of the Deity: see TRINITY. The majority of mankind are polytheists. MON'OTHEIST, n. *-thē-ist*, one who believes that there is but one God. MON'OTHEIS'TIC, a. *-is'tik*, pertaining to monotheism.

MONOTHELITES, n. plu. *mōn-ōth'ē-līts* [Gr. *monos*, single; *thēlō*, I wish, I will]: a heretical sect of the 7th century who taught that Christ had two natures but only one will, the human will being absorbed in the divine. MONOTH'ELITE, a. holding the doctrine that the human will of Christ was absorbed in the divine. MONOTH'ELISM, n. *-ēl-izm*, a modification of Eutychianism, introduced after the condemnation of that doctrine by the Council of Chalcedon, and which consisted in maintaining that, though Christ had two natures, the human and the divine, yet these natures possessed or acted by but a single will, the human will being merged in the divine, or absorbed by it. The author, at least the most active propagandist of this doctrine, was Sergius, Patriarch of Constantinople, who obtained for it the support of Emperor Heraclius; and its progress was materially forwarded by the silence which, at the instance of Sergius, and under his representations, the pope, Honorius (q.v.), was induced to maintain regarding the question. The doctrine was formally condemned in the sixth general council at Constantinople 680, with which condemnation it is commonly said that the early controversies on the incarnation were ended. The declaration of that council was that there are in Christ two natural wills and two natural operations thereof, without division, conversion, or change, with nothing like antagonism or confusion of the two; but that at the same time the human will in Christ could not come into collision with his divine will, but is in all things subject to it. See EUTYCHES: MONOPHYSITES.

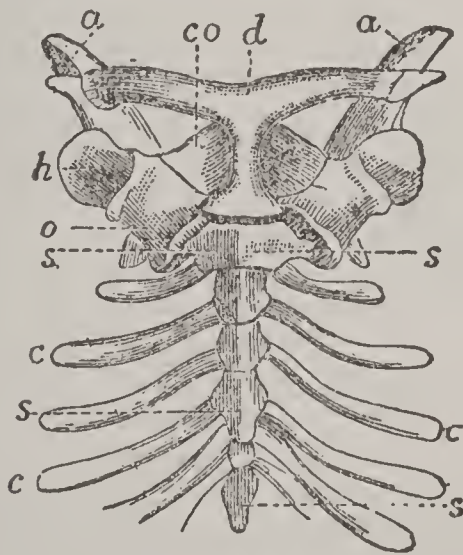
MONOTOMOUS, a. *mō-nōt'ō-mūs* [Gr. *monos*, alone; *tōmē*, a cutting]: in *min.*, having its cleavage distinct in one direction only.

MONOTONE, n. *mōn'ō-tōn* [Gr. *monos*, alone; *tonos*, a sound]: a succession of sounds having the same pitch; an unvaried tone of voice. MONOTONOUS, a. *mō-nōt'ō-nūs* [Gr. *monot'ōnos*, of the same tone]: having a continued sameness of sound; continued with dull uniformity. MONOT'ONOUSLY, ad. *-lī*. MONOTONY, n. *mō-nōt'ō-nī*, dull uniformity of tone or sound in speaking, reading, or singing; sameness; a want of variety.

MONOTREMATOUS.

MONOTREMATOUS, a. *mōn'ō-trēm'ā-tūs* [Gr. *monos*, single; *trema*, a hole or opening]: applied to the lowest mammals, viz., the Ornithorhynchus and the Echidna, which resemble birds in having a cloaca only, or one external outlet for excrements and genital products. **MONOTREME**, n. *mōn'ō-trēm*, one of the **MON'OTREM'ATA**, -trēm'-ă-tă, or monotrematous animals. **MONOTREMATA**, lowest order of mammalia, many of whose characteristic points indicate an approximation to birds. The skull is smooth; the brain-case very small as compared to the face; the snout much prolonged, and the jaws unprovided with soft movable lips, and not furnished with teeth. (In the ornithorhynchus, there are two horny plates in each half-jaw, which act as teeth, while in the echidna even these substitutes for teeth are wanting.) The cranial bones coalesce, as a bird's, at a very early period, and leave no signs of sutures. The external ear is altogether absent; while the eyes, though small, are perfectly developed.

The bones of the shoulder, forming the scapular arch, are unlike those of any other mammals, and in some respects resemble those of birds, and in other respects those of reptiles. At the top of the sternum is a T-shaped bone, formed by the union of the two clavicles, corresponding to the *furculum* in the bird's skeleton. The coracoid bones, which in other mammals are mere processes of the scapula, are here extremely large, and assist, as in birds, in strengthening the scapular arch.



Monotremata:

The breast-bone and collar-bone of the Echidna.

(From Milne-Edward's *Zoology*.)

a, acromi or process of scapula; *d*, bone corresponding to the usual collar-bones of mammals; *h*, cavity for the articulation of the head of the humerus; *o*, the prolongation of the scapula to the sternum; *co*, the coracoid bone; *s*, the sternum; *c*, ribs.

while the scapulæ themselves are produced beyond the socket of the humerus (the glenoid cavity), so as to articulate with the sternum. The pelvis is provided with marsupial bones, though these animals do not possess a

MONOTRIGLYPH—MONREALE.

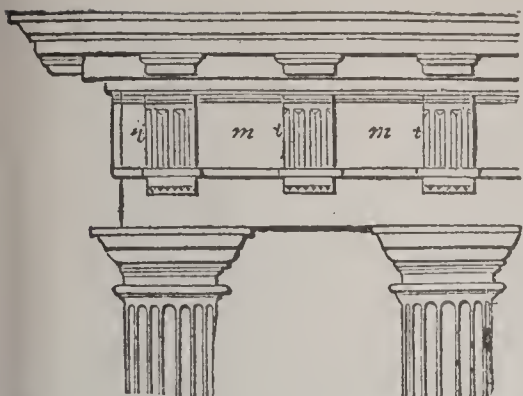
pouch. The feet have five toes, armed with long nails; in addition to which, the hind-feet of the males are provided with a perforated spur-like weapon connected with a gland. The Australian aborigines believe the wounds made by this spur to be poisonous; but there is no scientific evidence of the fact. The ovaries are analogous to those of birds, the right ovary being comparatively undeveloped, while the left forms a racemiform mass. The orifices of the urinary canals, the intestinal canal, and the generative canal, open, as in birds, into a common cloaca, from which circumstance the order *Monotremata* derives its name. The mammary glands, of which there is only one on each side, are not provided with nipples, but open by simple slits on each side of the abdomen.—This order includes only two or three species, all natives of Australia, or Van Diemen's Land, which, however, form two families—the *Ornithorhynchidæ* (see DUCK-BILL), and the *Echidnidæ* (see ECHIDNA).—No fossil remains of any animal of this order have as yet been discovered.

MONOTRIGLYPH, n. *mŏn'ō-trī'glīf* [Gr. *monos*, alone, and Eng. *triglyph*]: such an intercolumniation in the Doric order as brings only one triglyph over each column.

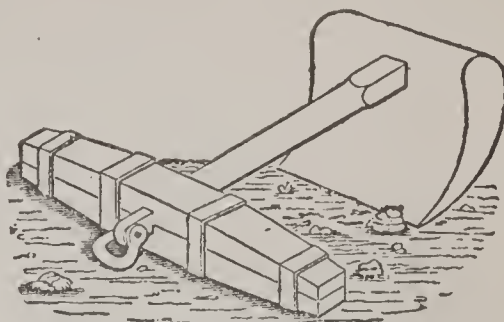
MONOTROPA, *mŏn-ŏt'-ro-pă*: genus of Ericacæ: low herbs, parasitic on roots or feeding on decay, the whole plant without green chlorophyll, its food being organic. The petals and leaves are scale-like. The INDIAN PIPE (*M. uniflora*) is waxy-white, with one flower. The PINE-SAP (*M. hypopitys*), white, brown, or red, has a raceme of flowers. The s. *Sweet Pine-sap*, with violet-scented bell-flowers, is rare; as also *Pine-drops* (q.v.).

MONOXIDE, n. *mŏn-ŏks'īd* [Gr. *monos*, only, and Eng. *oxide*]: one of a series of oxides containing 1 equivalent of oxygen and 1 equivalent of another element; DIOXIDE contains 2 of oxygen and 1 of another element; TRIOXIDE contains 3 of oxygen and 1 of another element; SESQUI-OXIDE, a compound intermediate between a *monoxide* and a *dioxide*, that is, containing $1\frac{1}{2}$ equivalent of oxygen to 1 of another element; thus CARBON MONOXIDE is an oxide containing 1 equivalent of carbon and 1 of oxygen.

MONREALE, *mŏn-rā-â'lā*: city of the island of Sicily, province of Palermo, 5 m. s.w. of the city of Palermo, on the flank of a steep hill. It has a cathedral, a palace, several conventual establishments, and possesses a healthful climate. The cathedral, begun about 1170, was and still is one of the most magnificent in Europe. Its extent is 80,630 sq. ft. The archiepiscopal palace and monastic buildings, were grand and splendid, but have mostly been rebuilt; though the cloister, remarkable for beauty, has been preserved. Its chief source of wealth is its export trade in oil, corn, and fruit; almonds being one of its most important products. Pop. 13,496.



Monotriglyph—Roman Doric: *m, m*, Metopes; *t, t*, Triglyphs.



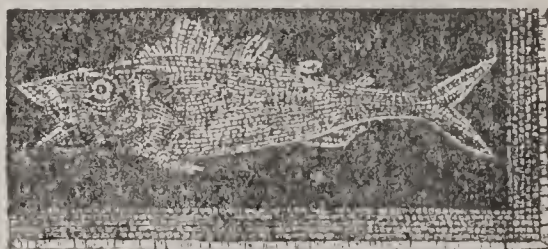
Mooring-block.



Morion of the time of Queen Elizabeth.



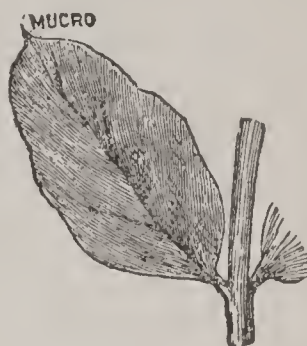
Monosepalous.



Ancient Roman Mosaic.



Mosquito.



Mucronate Leaf.



Mosaic.



Mudar Plant.

MONRO--MONROE.

MONRO, *mŭn-rō'*, ALEXANDER, *primus*, M.D.: anatomist, founder of the medical school of Edinburgh: 1697, Sep. 8—1767, July 10; b. London. He studied at London and Paris, and at Leyden under Boerhaave; and 1720, Jan., was elected by the town-council first prof. of anatomy in the Univ. of Edinburgh. In 1759, he resigned the anatomical chair to his youngest son, Alexander M., *secundus*.—M. published many anatomical and medical books and essays of value in their time. He was a fellow of the Royal Society of London.

MON'RO, ALEXANDER, *secundus*, M.D.: physician and medical prof.: 1733, Mar. 24—1817, Oct. 2; b. Edinburgh; youngest son of Alexander M., *primus*. He studied at the Univ. of Edinburgh; 1756, July, was appointed joint prof. of anatomy and surgery with his father in the university; and 1759 succeeded his father as full prof. of anatomy. He published many medical works of value, and was a member of many European learned societies.—His son ALEXANDER M., *tertius*, M.D., was conjoined with him in the professorship 1798.

MON'RO, ALEXANDER, *tertius*, M.D.: anatomical prof.: 1773, Nov. 5—1859, Mar. 10; b. Edinburggh; son of Alexander M., *secundus*. He was educated at the High School and Univ. of Edinburgh; studied in London; became joint prof. of anatomy with his father 1798; and succeeded him 1808. He was author of several professional works, and valuable papers. His retirement 1847 ended the more than a century and a quarter of connection of the M. family with the college of Edinburgh.

MONROE, *mŭn-rō'*: city, cap. of M. co., Mich., on the river Raisin, 2 m. from Lake Erie, with which it is connected by a ship-canal; 32 m. s.w. of Detroit. It is the eastern terminus of the Michigan Southern railroad. It has a large court-house, 7 churches, woolen manufactures, flour-mills, etc., and extensive grape-culture, with annual product of more than 100,000 gals. wine.—M. was settled by the French from Detroit 1784, and named Frenchtown: the name was changed in honor of Pres. Monroe 1817. It was the scene of the battle of the river Raisin, 1813, Jan. 22, between British troops with Indian allies, and an American force—the result being the massacre of several hundred American prisoners. Pop. (1880) 4,930; (1890) 5,258; (1901) 5,043.

MONROE, FORT: see FORT MONROE.

MONROE.

MONROE, *mŭn-rō'*, JAMES: fifth president of the United States: 1758, Apr. 28—1831, July 4 (pres. 1817–25); b. Westmoreland co., Va.; descended, according to the family tradition, from a Capt. Hector M. of the army of Charles I., a Scotch cavalier who emigrated with other cavaliers to Va. M. entered William and Mary College, but left it at the outbreak of the revolution, 1776, to join the continental army as lieut.; was wounded in the shoulder while leading the advance-guard at the battle of Trenton; lost his rank by serving as an aid 1777–8, taking part in the battles of Brandywine, Germantown, and Monmouth. After the war he studied law under Jefferson, who remained his close friend till his death, and who exerted a great influence upon him. In 1782 M. was elected to the assembly from King George co., and, though but 23 years old, was appointed by that body to the executive council. He was chosen a delegate to congress in 1783, and was active in the movement that led to the convention at Annapolis and the adoption of the federal constitution. He later, however, opposed its ratification, and took sides with the states' rights men. He was active in devising a system for the colonization of the public lands; was on the commission to settle the boundary between Mass. and N. Y.; and insisted on maintaining the right of the United States to navigation on the Mississippi. M. was a strong anti-federalist, vigorously opposing the administrative policy of Washington, and the financial policy of Hamilton. He had married in 1785, and his term in congress expiring next year, he settled in Fredericksburg, Va.; but, 1787, was re-elected to the general assembly, and, 1788, a delegate to the constitutional convention. Though one of the minority opposed to ratification, he was one of the first to hold office under the new constitution, being selected by the legislature to fill the vacancy in the senate caused by Grayson's death. He was senator 1790, Dec.—1794, May, when he was sent by Washington as minister plenipotentiary to France, where he was so popular as to be suspected of French sympathies by the administration, and, 1796, Aug., he was recalled. 1799–1802 he was gov. of Va.; and 1803 was appointed by Jefferson minister to France to negotiate the purchase of Louisiana, which he, with the resident minister, Mr. Livingston, succeeded in doing for \$15,000,000, two weeks after M.'s arrival in Paris. The same year he was made minister to England to secure measures against the impressment of seamen, and then to Spain to settle the disputes between that country and the United States with reference to the boundaries of La. In 1803 he was sent again to England to conclude, with Mr. Pinekney, negotiations for securing neutral rights. His mission was not satisfactory, and 1807 he was recalled to America. Here he was urged as a candidate for the presidency, but withdrew his name; and Madison having been elected, 1809, he made M. sec. of state, 1811; besides which he had also to perform the duties of sec. of war after the capture of Washington by

MONROE DOCTRINE.

the British 1814. He was elected to the presidency 1816, receiving 183 electoral votes against 34 for Rufus King, the federalist candidate. During his administration the states of Miss., Ill., and Maine were admitted into the Union; Fla. was purchased from Spain; and a treaty was concluded with England regarding the Newfoundland fisheries and the return of fugitive slaves. In 1820 he was re-elected with only one electoral vote in opposition to him. In 1821 Mo. was admitted into the Union, resulting in the 'Missouri Compromise,' by which, while slavery was permitted in Mo., it was forever prohibited north of lat. $36^{\circ} 30'$ elsewhere. It was during his second term that the independence of Mexico was recognized, and 1822 that of the provinces in S. America formerly under Spanish dominion. In 1823, Dec. 2, he issued his famous annual message containing the declaration of what has since been known as the 'Monroe doctrine,' and which defines the policy of the United States in its foreign relations. That policy is declared to be one of non-interference with the affairs of European nations, and insistence on a similar non-interference on the part of European governments with the affairs on the American continent—except as relates to the Brit. possessions in Canada. It declares that no European powers can 'extend their political system to any portion of either [American] continent, without endangering our peace and happiness. . . . It is equally impossible, therefore, that we should behold such interposition, in any form, with indifference.' After M.'s term of office expired, 1825, he retired to his home at Oak Hill, London co., Va., but continued serving his fellow citizens in various capacities, as justice of the peace; and 1829 as pres. of the convention to revise the old state constitution, which position, however, ill-health compelled him soon to resign. His wife died 1830, which, added to pecuniary embarrassment—the result in part of profuse hospitality—constrained him to remove to the home of his son-in-law, Samuel L. Gouverneur, in New York, where he died a year later. His body was removed from New York, and reinterred with imposing ceremonies in Hollywood Cemetery, Richmond, Va., 1858, July 5. It may be true, as Madison thought, that the country never fully appreciated M.'s services. His intellect was not brilliant, he had no gift as orator, he was influenced by strong party-feeling; still he was, through all, honestly desirous of serving his country. He developed the resources of the nation more than any one before him; the army and navy were enlarged and thoroughly organized; commerce was protected; the nation's finances improved; and the public service made more vigorous and efficient. The full story of his life, says his biographer, Prof. Gilman, in the 'American Men of Letters series,' 'will always reveal the mind and heart of a patriot, in new and trying situations, true to the idea of American independence from European interference.'

MONROE' DOCTRINE: see MONROE, JAMES.

MONROVIA—MONSIEUR.

MONROVIA: capital of Liberia (q.v.).

MONS, *mōngss* (Flem. *Berghen*): important town of Belgium (formerly fortified), cap. of the province of Hainault; on the Trouille, 35 m. s.w. of Brussels. Its fortifications were renewed and strengthened after 1818; but in 1866 in accordance with new arrangement for the defense of the country, they were demolished. The immediate vicinity can be laid under water by altering the course of the Trouille. The *Canal de Condé* connects the town with the Scheldt, and there is communication by railway with Brussels, Valenciennes, Charleroi, etc. Its principal architectural ornament is the cathedral of St. Waudru, dating from the 15th and 16th c.—a masterpiece of Gothic. The chief manufactures are woolen and cotton goods, cutlery, small-wares, and sugar-refining. The vicinity forms an extensive coal-field, with about 400 pits, which give employment to the people of six large villages with a pop. in all of nearly 70,000; the annual product of coal is two to three millions of tons. There is large trade in coals, flax, hemp, horses, and cattle. Pop. (1901) 26,989. **M.**, supposed to occupy the site of a Roman station, was made cap. of Hainault by Charlemagne 804. During the 17th and 18th c., it was frequently the object of contest between France and Austria.

MONSEIGNEUR, n. *mōng-sēn'yūr* [**F.** *monseigneur*—from *mon*, my; *seigneur*, lord: It. *monsignore*, my lord—from *signore*, lord]: in *France*, a title of courtesy properly belonging to princes, cardinals, and bishops; but in courtesy prefixed also to names of persons of high rank, or to titles of noblemen; a title of bishops, etc., in France; my lord; your grace or highness. This title was not applied to bishops till near the beginning of the 18th c., at which time they acquired it by general agreement so to address each other: its use was forbidden to them in France by the convention 1801. **MESSEIGNEURS**, n. plu. *mēs-sēn'yērz*, my lords. **MONSIGNOR**, n. *mōn-sēn'yōr*, or **MONSIGNORE**, n. *mōn'sēn-yōr'ā*, ordinary title of a bishop in the Rom. Cath. Chh.; honorary title conferred on certain priests attached to the Court of Rome: usual abbreviation, *Mgr.*, plu. *Mgrs.*

MONSELICE, *mōn-sā-lē'chā*: town of n. Italy, 13 m. s.e. of Padua. Pop. 3,160.

MONSIEUR, n. *mōs'sūr* [**F.** *monsieur*—from *mon*, my; *sieur*, sir, master]: sir; Mr.; also, denoting a Frenchman, in slight contempt. **MESSIEURS**, n. plu. *mēs'sū*, sirs. The title *Monsieur*, formerly applied in France to men of middle rank, is now universally applied to gentlemen. Its abbreviation is *M.*, sometimes *Mons.*; plu. *MM.*, sometimes *Messrs.* It is used also as a prefix to titles of rank or of office (in the latter case corresponding to our Mr. President, Mr. Secretary, etc.). In the middle ages it was prefixed to the title 'Saint', also to the names of popes and royal persons when spoken of. The oldest brother of the French king had it as his special title, being often spoken of as simply 'Monsieur'.

MONSIGNOR—MONSOON.

MONSIGNOR, etc.: see under MONSEIGNEUR.

MONSON, *mŭn'son*: town in Hampden co., Mass., 15 m. e. of Springfield, on the Boston and Albany, and New London and Northern railroads, 80 m. w.s.w. of Boston. It has valuable quarries of gneiss, manufactories of woolen goods, and of hats and bonnets, a national bank, several churches, a state school for the children of paupers of foreign birth, and a long-established, widely known, and successful academy of high grade, at which preparation for entering college has been made by many men of note in America.—Pop. (1870) 3,204; (1880) 3,758; (1890) 3,650; (1900) 3,402.

MONSOON, n. *mŏn-sŏn'* [It. *monsone*; F. *mousson*; Port. *monção*, a monsoon—from Ar. *maasaan*, or *mausim*, season]: periodical wind of the Indian and Arabian seas, blowing regularly from the s.w. from Apr. to Oct., and from the n.e., from Oct. to Apr. The existence of these winds was made known to the Greeks during the Indian expeditions of Alexander, and by this knowledge, Hippalus was emboldened to sail across the open sea to Muzeris, the emporium of Malabar. The monsoons depend, in common with all winds regular or irregular, on the inequality of heat at different places and the earth's rotation on its axis; but particularly they are occasioned by the same circumstances which produce the trade-winds and the land and sea breezes, being, in fact, the combined effect of these two sets of causes.

If the equatorial regions of the earth were entirely covered with water, the trade-winds (see TRADE-WINDS) would blow constantly from the n.e. in the north, and from the s.e. in the south of the torrid zone, with a belt of variable winds and calms interposed; the whole system, following the sun's course, moving northward from Dec. to June, and southward from June to Dec. But, especially in the e. hemisphere, large tracts of land stretch into the tropics, and give rise to the extensive atmospheric disturbances for which those parts of the earth are remarkable. During the summer half of the year, n. Africa and s. Asia are heated to a higher degree than the Indian Ocean, while Australia and s. Africa are much colder. As the heated air of s. Asia expands and rises, and the colder air from the s. flows in to supply its place, a general movement of the atmosphere of the Indian Ocean sets in toward the n., thus causing the wind to come from a *southerly* direction; but as the air comes from those parts of the globe which revolve more quickly to those which revolve more slowly, an eastward movement will be communicated to the wind, causing it to come from a *westerly* direction; and the combination of these two directions results in the s.w. monsoon, which prevails there in summer. Since, during winter, s. Asia is colder than the Indian Ocean, which, again, in its turn, is colder than s. Africa, a general motion of the atmosphere sets in toward the s. and w.: as this is in the same direction as the ordinary trade-wind, the effect in winter

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is not to change the direction, but only to increase the velocity of the trade-wind. Thus, while s. of the equator, owing to the absence of sufficiently large tracts of land, the s.e. trade-winds prevail throughout the year; on the n. of the equator we find the s.w. monsoon in summer, and the n.e. in winter; it being only in summer and n. of the equator that great changes are effected in the direction of the trade-wind.

Similar, though less strongly-marked monsoons prevail off the coasts of Upper Guinea in Africa, and Mexico. The e. and w. direction of the shores of these countries, or the large heated surfaces n. of the seas which wash their coasts, produce, precisely as in the case of s. Asia, a s.w. monsoon in summer. As might have been expected, the monsoon off the coast of Mozambique is easterly, and that off the coast of w. Australia northwesterly. The trade-winds also undergo considerable change in their direction on the coasts of Brazil, Peru, Lower Guinea, etc. These winds, though sometimes considered monsoons, are not truly such, for they do not change their directions periodically, so as to be opposite to each other, like true monsoons, but only veer through a few points of the compass. For a fuller account of these partial deflections, see TRADE-WINDS.

In India, in Apr., the n.e. monsoon changes into the s.w.; and in Oct., the s.w. into the n.e. These times depending on the course of the sun, consequently varying with the latitude, are called the breaking up of the monsoons, and are generally accompanied by variable winds, by intervals of calm, and by furious tempests and hurricanes.

Monsoons, when compared with the trade-winds, are seen to act a most beneficial and important part in the economy of the globe. Their greater velocity, and the periodical changes in their direction, secure increased facility of commercial intercourse between different countries. But the full benefits following in their train are not seen unless they be considered in their relation to the rainfall of s. Asia. Indeed, the fertility of the greater part of this fine region is due entirely to the monsoons; for if the n.e. trade-wind had prevailed there throughout the year, central and w. India, and many other regions, would have been scorched and barren sarahas. The rainfall of India depends entirely on the monsoons. The coast of Malabar has its rainy season during the s.w. monsoon, which brings thither the vapors of the ocean. On the Coromandel coast, on the other hand, it is the n.e. monsoon which brings the rain from the Bay of Bengal. The two coasts of Hindustan have therefore their seasons reversed, the dry season of the one corresponding with the wet season of the other,

MONSTER—MONSTRANCE.

MONSTER, n. *mön'stér* [F. *monstre*—from L. *monstrum*, anything strange or wonderful: Sp. *monstro*]: something out of the common order of nature; a creature with parts not natural, or greatly malformed (see **MONSTROSITY**, in Anatomy); a person looked upon with horror on account of extraordinary crimes, or of deformity, or power to do harm; anything uncommonly large: V. in *OE.*, to put out of the common and natural order of things. **MON'STERING**, imp. **MON'STERED**, pp. *-stèrd*: **ADJ.** very great in size or numbers. **MONSTROUS**, a. *mön'strūs*, unnatural in form; huge; enormous; shocking; hateful; horrible: **AD.** in a monstrous manner; exceedingly; very much. **MON'STROUSLY**, ad. *-lī*. **MON'STROUSNESS**, n. *-nēs*, the state of being monstrous. **MONSTROSITY**, n. *mön-strös'-ī-tī*, state of being monstrous; an unnatural production; that which is monstrous; a monster: see **MONSTROSITY**, in Anatomy: **MONSTROSITY**, in Botany.

MONSTRANCE, n. *mön'sträns* [L. *monstrans*, showing]; called also **OSTENSORY**: in the Rom. Cath. Church, the sacred utensil employed for presenting to view the consecrated Host (q.v.) for the adoration of the people, as well while it is carried in procession, as when it is exposed upon the altar on occasions of special solemnity and



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prayer. The use of the M. probably dates from the establishment of the festival of Corpus Christi, 13th c. It consists of two parts, the foot or stand upon which it rests, and the repository or case in which the host is exhibited. The latter contains a small semi-circular holder called the *lunula*, or crescent, in which the host is fixed; and it appears anciently to have been of a cylindrical or tower-shaped form, in the central portion of which, consisting of a glass or crystal cylinder, the host was placed. At present, it is more commonly in the form of a star or sun with rays, the central portion of which is of glass or crystal, and serves to permit the host to be seen. This portion, or at least the crescent, is of gold or of silver gilt; the rest is generally either of the precious metals, or at least gilt or silvered, though the lower portion is occasionally of bronze artistically wrought. In many cases, it is of most costly materials and workmanship. The M., like the other vessels used in the Eucharistic service, is consecrated by a bishop, or a priest delegated by a bishop. By a peculiar usage of the city of Lucerne, in Switzerland, the Eucharist is always carried in the M., when being borne to the sick,

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MONSTROSITY, in Anatomy: unnatural malformation at birth: term applied to an infant, or the young of any animal, which comes into the world impressed with the morbid changes that occur in fetal life, and of which it has never been observed that they have originated in the same way after birth. The term monster has frequently the same application. Monsters were formerly regarded as prodigies of nature; and in the dark ages, their occurrence in the human species was usually ascribed to the intercourse of demons with witches. It is now perfectly understood that the formation of those apparently anomalous beings may be accounted for by the same laws as those which govern the formation of perfect individuals—the only difference being that these laws in the case of monstrosity are more or less arrested or otherwise perverted.

Among principal causes of monstrosity are: 1. Something deficient or abnormal in the generative matter of one or both parents, because (see **HEREDITY**) malformations are frequently transmitted from parents to the children. Here the morbid change is impressed on the fœtus at the moment of impregnation. 2. Some morbid condition of the maternal organs or constitution may exercise a disturbing influence upon development. 3. Diseases and abnormal states of the placenta, of the membranes of the ovum, and of the umbilical chord, may induce an arrest of development; for example, it may be easily understood how abnormal shortness of the cord may favor the origin of fissure of the abdomen; while a cord of disproportional length may coil round one of the extremities, and by constriction may dwarf it, or even amputate it. 4. Morbid influences acting directly on the fetus,—e.g., mechanical injuries and diseases affecting it—are most frequent causes of malformations. From the experiments of several observers, it has been shown, that by submitting hen's eggs to various mechanical influences during incubation, the development of the embryo may be interrupted, or modified in such a manner as to give rise to malformations; and many observations tend to prove, that mechanical influences affecting the womb (kicks, blows, or falls) in the early months of pregnancy, produce certain malformations, by causing arrest of development. Moreover, the fact that certain malformations usually occur only in twin or triplet pregnancies, favors the view, that certain monstrosities are due to pressure and confined space.

Of the various classifications of monstrosities, the following is perhaps the best: 1. Malformations in which certain parts of the normal body are entirely absent, or are too small. 2. Malformations produced by fusion or coalescence of organs. 3. Malformations in which parts naturally united, as in the mesial line of the body, are separated, and clefts or fissures occur. 4. Malformations in which natural openings are closed. 5. Malformations of excess, or in which certain parts have attained disproportional size. 6. Malformations in which one or more

parts have an abnormal position. 7. Malformations of the generative organs.

The *first class* includes (1) completely shapeless malformations, in which the monster presents the appearance of a lump or mass, with no indication of definite organs; (2) malformations which consist of only a more or less rudimentary trunk, with no head or extremities; (3) trunkless monsters, in which the inferior parts of the body are lacking, and little more than a rudimentary head is present, which, instead of neck and trunk, is furnished with a pouch-like appendage, containing rudimentary viscera and pieces of bone; (4) malformations in which the head, and sometimes a portion of the upper part of the body, are wanting, constituting acephalic monsters, which are not very rare, the number of recorded cases in the human subject being over 100; (5) malformations in which the whole head is not absent, but some of its component parts are lacking; e.g., the brain, some of the cranial bones, the nose, or the eyes; (6) cases in which the extremities are absent or imperfect to greater or less degree—e.g., they may be mere stumps, with the fingers and toes either absent or rudimentary, or the hands and feet may appear to exist independently of arms and legs, and to be inserted immediately into the trunk; (7) cases in which all the organs may be present, but some of them may be too small—thus, there may be general dwarfishness, or the head or limbs may be abnormally small. None of the monsters of this class, except those included in the last two groups, are viable.—In the *second class* are included such cases as (1) the various forms of *cyclopia*, or coalescence of the eyes; these malformations are not very rare in the human subject, and are frequent in pigs and other animals; though usually born alive, these monsters are not viable; (2) coalescence of the lower extremities either into a common limb, which supports two feet, or into an undefined tail-like mass; (3) minor amalgamations, which do not affect vitality, as more or less perfect coalescence of the fingers and toes.—The *third class* embraces such cases as (1) fissures of the cranium, generally due to hydrocephalus in the fetus; (2) harelip and cleft palate; (3) fissures on the neck, whose origin is due to the respiratory clefts—which, during the formation of the embryo, appear in the cervical region, not uniting at an early stage, as in the normal condition, but remaining more or less open; (4) fissures of the vertebral arches of the spinal column, occasioning the affection known as *spina bifida*; (5) fissures of the thorax, in which case the lungs or heart are more or less exposed; (6) fissures of the abdomen.—The malformations of the *fourth class* include congenital closure of the anus, the mouth, the nostrils, etc.—The malformations of the *fifth class* may be arranged in two divisions, according as certain parts are too large, or there are supernumerary organs. The *fifth class* is very extensive, and embraces many varieties. One or more parts

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may be disproportionally large—e.g., the head in cases of congenital hydrocephalus; or there may be one or several supernumerary organs—a sub-class which presents a very great range, from the simplest cases, in which a single joint of a finger is supernumerary, to those of a highly complicated nature, when two or even three bodies are united by some one point. There may be a single head and trunk and supernumerary parts—as, for example, supernumerary teeth, vertebræ (giving rise to the formation of a tail in the human subject), ribs, mammæ, fingers, toes, etc.; or there may be malformations with more than one head and trunk—double, or even triplet monsters. This sub-class is divisible into two groups, according as the united individuals are equally developed, or as only one is developed: the second being more or less atrophied, and forming a parasitic appendage to the first. Examples of the first group, are (1) duplication of the head and upper part of the vertebral column; (2) duplication of the head, neck, and upper extremities, while the chest and abdomen are single, or fused into one another (in this group, we must place the twin-monster, Rita Christina, born in Sardinia 1829, Mar., and brought alive to Paris, where she died in Nov. following); (3) almost complete duplication, with separation of the two bodies, except at a single spot, as in the case of the Siamese twins; (4) triplet monsters, such as the child with three heads born 1832 in Catania (see Geoffroy St. Hilaire, *Histoire des Anomalies de l'Organisation*, III, 327). To the second group belong such cases as the following: (1) a perfect individual may bear on its head another head, with traces of the rest of the body; (2) on a well-developed body, a second, smaller and defective one, may be situated, which, after birth, does not increase in size; (3) in a more or less perfectly developed individual, there may be concealed, commonly in the abdomen, parts of a second individual—a condition which has received the name of *fœtus in fœtu*, and which is probably caused by the inclusion of one germ by another.—To the *sixth class* belong (1) those cases in which there is a reversing of the position of the internal organs—when the heart and spleen lie on the right, and the liver and cæcum on the left side; (2) anomalies in the course and distribution of individual vessels.—For malformations constituting the *seventh class*, see HERMAPHRODITISM.

The term *Teratology* [Greek *têras*, a prodigy, and *lôgos*, a discourse] is now frequently applied to the history and science of monstrosities.—For further information on this subject, see Geoffroy St. Hilaire (1832–36); Otto (1841); ‘Teratology,’ by Vrolik, in *The Cyclopædia of Anatomy and Physiology*; the German works of Förster (1861) on human, and Gurlt (1877) on animal monsters,

MONSTROSITY—MONTAGU

MONSTROSITY, in Botany: malformation or abnormal development of any part of a plant. It may take place, however, at any period of the growth of a plant, as to any new organ that is developed, and sometimes affects merely a particular organ or some portion of a plant, e.g., a particular leaf, flower, petal, sepal, etc., or the leaves or flowers of a particular branch, while in other cases all the organs of the same kind exhibit the same abnormal character. It is now well known that monstrosities in plants as in animals are the result of special conditions affecting the operation of ordinary natural laws; and the study of monstrosities is very important in relation to that of the nature, development, and metamorphosis of organs. For some of the most frequent monstrosities, see **METAMORPHOSIS OF ORGANS**. Monstrosities in plants are not always, as in animals, reckoned deformities. *Double flowers* afford a familiar example of an opposite kind; though in relation to the plant itself they have the effect of unfitting it for one of the functions of a perfect plant, reproduction by seed.

MONSTROSITY, MONSTROUS, etc.: see under **MONSTER**.

MONSTRUOSITY, n. *mŏn'strô-ôs'ĩ-tĩ*: OE. for **MONSTROSITY**.

MONTAGNANA, *mŏn-tân-yâ'nâ*: town of n. Italy, province of Padua, situated pleasantly on the banks of a canal, Il Fiumicello, 32 m. s.w. of Padua. It is still protected by walls and towers, and has a fine cathedral and palace. Its chief trade is in spun-silk, wool, hemp, and coarse cotton textures. Pop. 7,657.

MONTAGNARDS, *mŏng-tân-yâr'*, or simply **MONTAGNE**, 'the Mountain': name given to the extreme democratic politicians in the first French Revolution, because they seated themselves on the higher benches of the hall in which the *National Convention* met, 1789-91. Their principal members were Danton, Marat, Robespierre, St. Just, and Collot d'Herbois, the men who introduced 'the Reign of Terror.' The opposite party of the 'Plain' (*Plaine*) were the Girondists (q.v.), who sat on the lowest benches on the floor of the house. After the overthrow of the Girondists, this part of the house was styled the 'marsh or swamp' (*marais*), and included all the subservient members whose votes were under the control of 'the Mountain.' A few leading men gave all its strength and formidable character to the party of the Mountain.—After 1848, the extreme party in the *National Assembly*, composed of revolutionary democrats and communists, sometimes flattered itself with the designation of 'the Mountain;' but events proved that it possessed nothing of the genius, though it showed all the malignity of its terrible predecessor.

MONTAGU, CHARLES: see **HALIFAX, EARL OF**.

MONTAGU.

MONTAGU, *mŏn'ta-gŭ*, FAMILY OF: family in the English nobility, said, by Durke, to derive their name (which in Latin was and is always written *De Monte Acuto*) from a place in Normandy. The first of the M. who settled in England was a warrior who came over in the train of Robert Earl of Moreton at the Conquest 1066.—Five centuries later, his descendant, Sir Edward Montagu, was lord chief justice, in succession, of the courts of king's bench and common pleas under Henry VIII., who also appointed him one of the executors of his will and guardians of his son Edward.—His grandson, a distinguished orator, represented the city of London in parliament; and having been lord chief justice of the court of king's bench, and lord treasurer of the kingdom, was raised to the peerage as Earl of Manchester.—The second earl gained distinction as a gen. in the parliamentary army, and particularly by his victory over Prince Rupert at Marston Moor; but he scrupled to take part in the condemnation and beheading of Charles I., and was one of the first members of the house of peers who gave in his adhesion to Charles II. on his restoration.—This nobleman's grandson enthusiastically espoused the cause of William III., under whom he fought at the battle of the Boyne, and took part in the siege of Limerick. He was subsequently sent as ambassador to Venice, and to the courts of France and Vienna, and eventually was raised to the dukedom of Manchester by George I.—The title is held by his descendant, the 7th duke.—Other branches of the M. family were ennobled in the persons of the Earl of Sandwich, the Earl of Halifax, and the Duke of Montagu, but the last two titles both became extinct before the close of the 18th century.

MON'TAGU, Lady MARY WORTLEY: 1690–1762, Aug. 21; b. Thoresby, Nottinghamshire, England; daughter of Evelyn Pierrepont, Earl, afterward (1715) Duke of Kingston, and of Lady Mary Fielding, daughter of the Earl of Denbigh. She is said to have received a classical education. When only eight years of age, she was introduced by her father to the famous *Kit-Cat Club*, and formally admitted a member. Her fond and pleasure-loving father allowed her to educate herself. She is even said to have taught herself Latin. She became attached to Edward Wortley Montagu, member of the house of commons, whose cousin, Charles Montagu, was created Earl of Halifax and appointed first lord of the treasury by George I. As the match was disapproved by the families, she eloped and married him. On the accession of George I., she came to London with her husband, who was a whig. Lady Mary's beauty and wit attracted universal admiration at court. She was on terms of familiar acquaintance with Addison and Pope, the latter becoming her enthusiastic admirer, and writing 'flames and raptures' for her, until his passion 'came to a climax in an impertinence, and was extinguished by a box on the ear, or some such rebuff.'

In 1716, Wortley Montagu was appointed ambassador to Constantinople. He was accompanied by Lady Mary, who, on her journey, and during her residence in the Levant, wrote the well-known *Letters*, which form one of the most delightful books in our language. The weaknesses of a somewhat vain and capricious temper fade into forgetfulness, when we remember the strong sense, enlightened courage, and generous perseverance which introduced into Europe the practice of inoculation (q.v.), which she witnessed in Turkey. She had so much faith in its safety, that she tried it first on her own son. After her return to England, she fixed her residence at Twickenham, and renewed her intimacy with Pope. But political soon led to personal differences, and these resulted in one of the most famous literary feuds of the 18th c. The immediate occasion of it was the publication by Lady Mary of her *Town Eclogues*. She was fiercely assailed by both Swift and Pope, and was not slow to retaliate. In 1737 she left her country and her husband (for reasons not known), and lived many years in Italy, chiefly at Lovero, in the province of Venice. Her husband died 1761. At the request of her daughter, afterward wife of the Earl of Bute, she returned to England, where she died. She was brilliant, eccentric, unconventional, always liable to be misunderstood; but her letters show her to have had a warm heart. A collected ed. of her works, with life, was published by her great-grandson, the late Lord Wharnccliffe, 1836, of which a third ed. (the best) appeared 1861, with memoir by Moy Thomas.

MONTAIGNE, *môn-tân'*, F. *mông-tân'*, MICHEL EYQUEM DE: distinguished French moral philosopher: 1533, Feb. 28—1592, Sep. 11; b. at his paternal home of Montaigne, in Perigord. In accordance with his father's eccentric ideas on education, he was taught and allowed to speak only Latin from his earliest infancy, in consequence of which he acquired such mastery of the language, that when, in his seventh year, he entered the college of Bordeaux, with its 2,000 scholars, his masters, Guérente, Buchanan, and Muret, were almost afraid to address him. On the expiration of his studies, which were directed to law, he received 1554 the appointment of counselor in the parliament of Bordeaux; but being possessed of ample means, and having no inclination for a public life, he applied himself to the study of the various schools of Greek and Roman philosophy; and on the death of his father, in compliance with whose wish he had made a translation of the nat. theology of Raymundus Sebondus (Paris 1569), he retired to his ancestral estate, where he lived in retirement during the terrible season of religious oppression which desolated France for many years. During this period, 1580, he composed the first two books of his celebrated *Essais*, the third portion of which appeared 1588, after his return from extensive travels. M.'s *Essais*, though not conceived in the spirit of a believing Christian, or marked by the reticence and

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delicacy of expression which modern refinement demands, are very extraordinary productions, not only for their learning and sound reasoning, but also for the frank and liberal tone in which social questions are discussed, notwithstanding that the author wrote at a period when religious differences and party feelings blinded the judgments of men. M.'s ethics were those of Seneca and the other philosophers of ancient times, whose works he had thoroughly mastered; and, judged from our point of view, his morality is that of a virtuous pagan merely; but when we bear in mind the turmoil of civil war, and the consequent disorganization of society, together with the low ebb of literature in France at that period, we must do justice to the great merit of the writer, and the influences for good which his writings exerted. His writings give charm rather than inspiration; the style is flexible and easy; and though method is almost lacking, M. deals in deft touches of genial humor with almost all of human life. It was part of his humor to assume an attitude of pessimism; but the real spirit of his work and its actual influence will be found more in accord with deep truth than his mere expressions at first suggest. M. was a constant, and occasionally a successful, mediator between the party of Henry of Navarre and that of the Guises, and stood in relations of friendship with men of all creeds. He died as an avowed member of the Church of Rome, in whose doctrines he professed implicit faith, notwithstanding the skeptical bias which he had through life been at no pains to conceal. Numerous editions have appeared of his *Essais*, among which are those of Le Clerc (Paris 1826), and MM. Courbet and Royer (Paris 1873-77). Nearly 200 years after his death, the discovery was made at Montaigne of the ms. of his travels, published at Paris 1774, under the title of *Journal de Voyage de M. de M. en Italie par la Suisse et l'Allemagne*. Translations of the *Essais* exist in almost all the European languages; the best English translation is that by Cotton. The best biographies of M. are by Grün (Paris 1855); Payen (Paris 1856); and Bayle St. John (Lond. 1857).

MONTAJONE, *mōn-tā-yō'nā*: town in n. Italy, about 25 m. s.w. of Florence. It is not far from the coast, and has famous medicinal springs. Pop. 10,553.

MONTALCINO, *mōn-tāl-chē'nō*: town in the province of Siena, central Italy, 22 m. s.s.e. of the town of Siena; on a hill in the midst of valleys. It has a fine equable climate. The wine of M. is in great repute throughout Tuscany. Pop. 7,540.

MONTALEMBERT.

MONTALEMBERT, *mōng-tâ-lōng-bär'*, CHARLES FORBES, Comte DE: 1810, May 29—1870, Mar. 13; b. London; of an ancient family of Poitou. His father was created a peer of France 1819 under the Restoration, and for a considerable time was minister of the French court in Sweden. His mother was of the Scottish family of Forbes, which fact accounts for M.'s remarkable familiarity with the English language, and his intimate knowledge and strong admiration of the social and political institutions of England. Although his more advanced studies were carried on in the University of Paris, a considerable part of his youth was spent in Sweden; and the first work by which he was brought into notice was a pamphlet on Sweden, published in his 19th year. On the death of his father, M. succeeded to his honors, and later to his seat in the chamber of peers. But his earliest public appearance was in what may be truly considered the great labor of his life, a joint effort in which he associated himself with the Abbé Lacordaire (q.v.) and other friends, for the purpose of taking advantage of the recent charter, by establishing a free school for Liberal Catholic education, independent, as well of the university, as of all other state influence. An attempt by the police to interfere arbitrarily with this project, became the subject of a trial before the chamber of peers, which M. rendered memorable by his first speech, one of the most brilliant on record, and a clear foreshadowing, not alone of the eloquence, but of the bold and uncompromising earnestness in the cause of his church and of the common interests of religious liberty, which constantly characterized his later career. Of the struggle of the Liberal Catholic party in France against what they regarded as the arbitrary monopoly of education which was claimed for the university, M. was for many years the leader and the champion; and he never ceased to advocate the same principles in the various works in the preparation of which he employed his leisure from public duties—*Life of St. Elizabeth of Hungary*, *Life and Times of St. Anselm*, and, above all, an appeal *On the Duty of Catholics on the Question of Freedom of Education*, which he wrote during a visit to the island of Madeira for his health 1843. After the revolution of 1848, M., true to his former professions, was one of the first of his party to accept the new state of things, and to use the actual means at his disposal for the furtherance of the views which he had consistently advocated. He was elected member of the national, and afterward of the legislative assembly; and for a time contrived, while he continued the same line of policy as regards church interests, to give a general support to the govt. of Louis Napoleon as pres. of the republic. His first break with that govt. was on the question of the proposed confiscation of the Orléans property; and after the *coup d'état* of December, the breach became irreconcilable. From that time, M. continued the implacable assailant of the arbitrary repression of public opinion

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which characterized some measures of Napoleon III.; and the brilliant and enthusiastically admiring pictures which, in his *Political Future of England*, he has drawn of its social and political institutions, derive much of their vigor from their covert but palpable contrast with the condition of France. M. had strong religious sentiment, and was gifted with an almost too fluent eloquence. Besides numerous articles contributed by him to the *Revue des Deux-Mondes*, the *Encyclopédie Catholique*, and the *Correspondant*, he wrote: *L'Avenir politique de l'Angleterre* (1855); *Les Moines d'Occident depuis St. Benoît jusqu'à St. Bernard* (1860-67; his chief work; English translation, 7 vols. 1861-79); *Une Nation en deuil, la Pologne en 1861*; *L'Eglise libre dans l'Etat libre* (1863); *Le Pape et la Pologne* (1864), etc. See *Memoir* by Mrs. Oliphant, 2 vols. (1872).

MONTALIVET, *mōng-tā-le-vā'*, MURTHE CAMILLE BACHASSON, Count DE: 1801, Apr. 25—1880; Jan. 4; b. Valence, France: statesman. He was educated in the Polytechnic School in Paris; took his seat in the chamber of peers 1826; was appointed minister of the interior 1830, Nov., minister of public instruction 1831, Mar., and again minister of the interior 1837, Apr.; and was elected a senator 1879. He was a strong constitutional monarchist; supported the Orléans family; opposed Guizot and the *doctrinaires*; and gave his adhesion to the republic 1872, as presenting the only form of free govt. then possible for France. He published, in defense of the Orléans family, *Le Roi Louis-Philippe et la liste civile* (1851), and *Dix années de gouvernement parlementaire* (1862).

MONTALVAN, *mon-tâl-vân'*, JUAN PEREZ DE: 1602-1638, June; b. Madrid: dramatist. He was a son of the royal bookseller; became a licentiate in theol. in 1619; began writing for the theatre under the direction of Lope de Vega about the same time; was ordained a priest 1625; and by 1632 had written 36 dramas and 12 *autos sacramentales*. The pressure of dramatic writing made him insane shortly before his death. Besides the above dramas he left about 60 plays, and *Orfeo*, poem (1624), *Life and Purgatory of St. Patrick* (1627), *Para todos*, stories (1632), and a tribute to his friend Lope de Vega (1636).

MONTANA.

MONTANA, *mŏn-tā'na*: state; one of the United States of America; 28th in order of admission to the Union, and thus the 41st state.

Location and Area.—M. is one of the extreme n.w. states; lat. $44^{\circ} 15'$ — 49° n., long. 104° — 116° w.; length on n. border 540 m., along 45th parallel 460 m.; average breadth n. and s. 275 m.; 146,080 sq. m. It is bounded n. by the Dominion of Canada, w. and s.w. by Idaho, s. by Wyoming, e. by S. Dak. and N. Dak.; average elevation above sea-level about 3,900 ft.

Topography.—M. has two great natural divisions, according to the general character of the country: 1. The western third, the character of which is made by the mountains, which form the crest of the continent and have given M. the name of 'the mountain state;' and 2, the eastern two-thirds, a vast expanse of plateaus, rolling prairies, and level plain, especially in the n.e. The mountain region consists of a succession of ranges and valleys running generally n.w. and s.e. Besides the main range of the Rocky Mts., which enters the w. part of M. from the n. and extends 200 m. s.e., and there bends in the direction of the w. boundary, there are the Bitter Root, which the main range meets at the w. boundary, the Deer Lodge, Bear Paw, Big Horn, Powder River, and Gallatin ranges; the little Rockies, the Beltrange s. of the Great Falls of the Missouri, the Highwood in the n., the low-lying Spoonbill, and many detached spurs and sloping buttes. The chief mountain region extends entirely across the w. end of the state, from n. to s., with a width of 175 m. The general elevation is much greater in the s. than in the n. Between the ranges are deep divides; rivers wind round the spurs; and cañons separate the buttes. In the s. part, near the Yellowstone river, the mountains rise 11,000 ft. above sea-level, covered with perpetual snow, and in the n., beyond the Missouri, the mountain-tops in early autumn are seen for many miles across the treeless plains, mingling the snowy purity of their tops with the blue of the sky. Toward the n. the ranges are so nearly continuous as to force the streams into long circuits, but in the s.w. the ranges are more broken, and afford numerous low passes and water-gaps. The chief peaks in M. are: Emigrant Peak 10,629 ft.; Mt. Powell 10,500; Ward's Peak 10,371; Mt. Cowan 10,351; Mt. Washburn 10,134; and Mt. Delano 10,200. Away from the region of mountains are found solitary peaks of basalt, tuff, and other volcanic rock, which appear of rocky solidity and hardness, but are in fact frequently soft enough to be cut with a knife. The scenery among the Rocky Mountains of M. is scarcely surpassed in the world. There are no wonders greater than those found in the region drained by the head-waters of the Missouri river. One of these is the Fire Hole basin, in the valley of the Madison, containing many hundreds of boiling springs and spouting geysers, which far exceed those of Iceland in size and grandeur. The Grand Geyser, the most magnificent in the world, throws a stream of hot water to the height,

of 300 ft. The cañon of the Yellowstone is a great rent in the mountain range, with perpendicular basaltic walls 1,000 to 2,000 ft. high. For 25 m. along this chasm the river rushes with fearful velocity, making in one place a fall of 300 ft., one of the grandest cataracts on the globe. Out of this mountain region, partly in M. and partly in the n.w. corner of Wyoming, has been formed an immense 'National Park,' two-thirds the size of Connecticut, within the limits of which are not less than 10,000 geysers and boiling springs, many grand waterfalls, beautiful lakes, deep cañons, and mountain peaks.

The eastern two-thirds of M. is a generally monotonous expanse, broken only by the beds of the few streams which traverse it, and by a few small groups of hills. It extends through nine degrees of latitude in a gently uniform upward slope from e. to w., rising from 2,000 ft. above the sea at the e. boundary to 4,000 at the base of the Rocky Mountains. Except along the streams and upon the scattered groups of hills, no forest growth of any kind is found, and vegetation is limited to the bunch grasses, very valuable for grazing, and to artemisia and cacti. The grasses are most abundant and luxuriant near the mountains, where the rainfall is greatest.

In the mountain region of M. are the head-waters of the Missouri (Atlantic basin), and Clarke's fork of the Columbia (Pacific basin). The Missouri has three head-streams, the Jefferson, Madison, and Gallatin, which meet at the foot of the Gallatin valley, at a point known as 'the three forks of the Missouri.' From this point to its mouth, navigation is possible when the stream is not below its mean height, with the interruption made by the Great Falls between Helena and Fort Benton. From Fort Benton down, steam-boat navigation is good from April to September, and with improvements in the channel may be extended to the Great Falls. The other chief streams falling into the Missouri in M. are, on the n., the Sun, as high up as Great Falls, the Teton, just below Fort Benton, the Marias, not much lower down, but a stream of several branches, the Milk, a still greater stream with a long course in the n. middle part of the state, and the Poplar and Big Muddy, in the n.e. corner; and on the s. side of the Missouri such small streams as the Arrow and Judith, and one considerable river, the Musselshell, which drains a large area in the centre of the state and flows n. into the Missouri. The great Yellowstone river rises in the extreme s.w. part of M., and flows e. and n.e. to the Missouri, just over the boundary in N. Dak. It is navigable early in the season, and even as late as August, 300 m. above its mouth, and has tributaries on the s., the Big Horn, the Rosebud—where Custer's last battle with Sitting Bull took place—the Tongue, and the Powder. The Clarke's fork of the Columbia is formed by the union of the Flathead and Missoula rivers. The Missoula (treated sometimes as the lower reach of the Bitter Root) is formed from the Bitter

Root, Blackfoot, and some smaller streams, which gather the waters of the s.w. part of M. between the main divide of the Rocky Mountains and the Bitter Root range. It flows n.w., receiving on its course the Flathead, which comes from the n. through Flathead Lake, on the w. of the main range of the Rocky Mountains. Except Flathead and some small lakes in the s.w. part of the state, M. has no lakes. Flathead, 30 m. long and 14 wide, lies in the upper w. part of M., the country of the Flathead and Bannack Indians. It has dense forests of heavy timber, pine, tamarack, and fir, growing to the edge of the water, except on the n., which is open grassy prairie, with much tillable land. Timber is most abundant in the n.w. The trees most found throughout the state are pine, spruce, fir, cedar, and balsam; cottonwood, poplar, and willow. In sheltered glens among the mountains are found spots green with pine, cedar, and fir trees, and having a soil susceptible of high cultivation. Groves of cottonwood, ash, and hickory grow on the banks of the Missouri, and thickets of willows, in which the 'diamond willow' is found, are common. Grass, and wild flowers of rare beauty, abound in the valleys. Bunch grass covers all the plains and hillsides, giving rich grazing, not only in summer, but also through the open winters.

The valley lying n. and s. of Fort Owen, 80 m. long, 5 to 10 m. wide, and having an elevation above sea-level of 3,284 ft., has a soil of rich black loam, in which the cottonwood grows to the height of 70 ft., and pines to 150 ft. The Missoula valley, 15 m. wide for a length of 30 m., has a moderate climate and is well wooded. Prickly Pear valley, near Helena, is 5 to 15 m. wide and 20 m. long, with beautiful smooth meadows. The valley of the Teton, near Fort Benton, 2 to 6 m. wide, has bordering table-lands 75 ft. above it. Deer Lodge valley, at an elevation of 5,000 ft., is 40 m. long and about 12 m. wide, with a central stream its whole length, and mountain rivulets falling into it on either side. Sun River valley, with its swift stream, and timber of cottonwood and ash, is one to three m. wide, and for 25 m. beyond the crossing of the road from Helena to Fort Benton is 5 m. wide. The basin through which the Judith river flows is 50 m. wide and 80 m. long, and besides the main stream there are the w. and s. forks and Big Spring creek. In the area between these valleys are extensive cattle ranges, taken up by residents of the towns, and visited semi-annually.

Climate.—The isothermal line of Philadelphia is found at St. Paul, Minn., the Red River valley in Dak., and through M., giving this state a notable climate, in its effect on health, agriculture, commerce, and business interests, such as the grazing of cattle. The atmosphere is peculiarly dry, and is exceptionally invigorating and health-giving. It perfectly matures the wild grasses, and leaves them as ripe and sound as the best hay for the winter grazing of sheep and cattle, so that herding

reaches the perfection of ease and cheapness. The annual mean temperature ranges from 44° to 48° . Sudden and extreme changes are frequent; in every month of the year frosts and snow-storms are possible. A November sun sometimes shines with as much intensity as in July, and the traveller may set out for a journey of 150 m. in a linen coat and require a fur coat before he comes to his destination. The length of the summer days, the total amount of sunlight for a season, and the delicious life-giving winds far more than make up for the fierce storms, the winds laden with dry snow and sand which make the deadly blizzard, and the very infrequent continuance of heavy snow covering the ground. A peculiar wind, the 'chinook,' which has come over the Pacific from China and Japan—a strong and warm wind—leaves its moisture as it passes over the cold forest-clad mountains, and flows over M., into the Dakotas, with a dryness which in winter vaporizes and absorbs the snows, and a purity at all times singularly health-giving. Before the terrible cold and snow blockade for weeks together of 1881, the wild bunch, buffalo, and gama grasses were found ample food for stock throughout the year. Hay is made on the river bottom-lands and carried into the interior, but except at forts little is needed. The winter of 1886-7 was one of very exceptional cold and snow, following a summer in which drought greatly injured the grass-crop; and the result to the stock-grazing interest was a loss of cattle estimated at \$25,000,000. In ordinary years the snows of winter do not, by thawing and freezing, become a solid mass covering the ground, but are very much blown from the ranges, or taken up by the dry air, leaving the ripe grass exposed for the cattle to feed upon.

The rainfall over most of the state does not vary much from the average at Fort Benton, 12.17 in. annually. In the n.w. region, the drainage area of the Clarke's fork, it is twice as much, giving enough for forests and for agriculture. From the mountain valley about the heads of the Missouri, across all the plains of the central and e. parts of the state, there is in general an insufficiency of rain, and trees are lacking.

Geology.—Azoic formations prevail in the w.; and eastward there appear first the Jurassic, next the carboniferous, and near the Dakota line the tertiary. Along the base of the mountains are beds of Jurassic and carboniferous rocks. Potsdam sandstone and brick-making clay are abundant, and some granite is found. Slate is found in large quantities in the placer-mining districts. In all sections the strata are much broken, and present a great variety of formations.

The plains which at the mouth of the Yellowstone are 2,010 ft. above sea-level rise gradually to 4,091 ft. at the base of the mountains, the elevation of the valleys varying from 3,000 to 5,000 ft. The cretaceous strata in the n. yield coal of the best quality, which is mined in the vicinity of Bannack, Helena, Virginia City, Deer Lodge, and Fort Benton; and there are evidences of its presence

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on the Missouri, Musselshell, and Yellowstone. Petrifications of all kinds—e.g., of snails, snakes, sea-serpents, buffaloes' bones, etc.—are found near the Missouri.

Mining stands first among the industries of M., where gold was discovered 1852, on a small creek w. of the main divide of the Rocky Mts., near the site of what is now Deer Lodge; 1861 the first mine was opened, and 1863 the first quartz mill erected. The chief quartz mines are near Argenta, Bannack, and Helena; and Helena and Virginia City are the great mining centres. The rich placer mines yielded their greatest return in the early mining days; later the more permanent and productive quartz-lodes of gold, silver, and copper, which seem to fill the entire range and all the spurs of the Rocky Mountains, have been worked. The gold production of M. was as follows for 15 years: (1862) \$600,000; (1863) \$8,000,000; (1864) \$16,000,000; (1865) \$18,000,000; (1866) \$17,500,000; (1867) \$16,300,000; (1868) \$15,000,000; (1869) \$11,200,000; (1870) \$9,000,000; (1871) \$8,000,000; (1872) \$7,000,000; (1873) \$5,200,000; (1874) \$4,000,000; (1875) \$4,100,000; (1876) \$4,500,000. The decrease here marks the decline of early mining, when quartz mining had not begun to yield over \$1,000,000 a year. The rise from this was steady. The yield of gold, silver, lead, and copper reached (1882) \$8,004,000; (1883) \$9,879,000; (1884) \$11,862,000; (1885) \$21,000,000; (1886) \$22,300,000; (1887) \$25,483,272; (1888) \$32,475,000. The separate items for 1886 were: gold \$3,450,000; silver \$9,600,000; copper \$8,000,000; lead \$1,250,000. The two chief items of 1887 were: gold \$5,778,536; silver \$17,817,548. There are in operation (1889) ten gold mills, 18 silver mills, 7 lead smelters, 8 copper smelters, and about 25 concentrators, the combined capacity of which is 5,000 tons a day. The silver as mined contains 20 to 35 per cent. of its gross value gold, chemically combined with it. One-fourth the value of the copper as found is silver chemically combined with it. The lead would not pay for mining but for the silver which it contains, and for its uses in collecting the silver and gold in the process of smelting. In the calendar year 1901 the production of gold was 229,495 fine ounces, valued at \$4,744,100, and of silver 13,131,700 fine ounces, of a coining value of \$16,978,360, and a commercial value of \$7,879,020.

Zoology.—The wild animals of M. have been numerous and of great variety, but are disappearing as the country is settled. Great herds of deer, elk, mountain-sheep, antelope, were found in the mountains and on the foothills and plains of the mountain regions. The moose was frequently seen in the mountain gorges. Buffaloes, now no longer to be found, have been abundant at all points on the Missouri. In 1880, June, between Fort Peck and Paradise valley, it is estimated that 20,000 were seen on one day, and 500,000 on another. Deer and antelope visit the rivers in the morning. Wolves are often seen on the prairies; grizzly bears, black bears, mountain lions, lynxes, and wild cats are plentiful in the forests;

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badgers, minks, otters, martens, and beavers are found; and in the streams trout, whitefish, and salmon.

Agriculture.—The state as a whole is not as available for agriculture as for mining and grazing; yet its many valleys are easy of irrigation and are remarkably fertile, yielding large returns in wheat, oats, barley, and all kinds of vegetables and fruits. Circumstances peculiar to the climate have in some seasons caused the failure of crops; but in the w. part of the state the valleys of the Prickly Pear, Gallatin, and Bitter Root rivers, and in the n. the valley of the Teton and Sun rivers, are unsurpassed for agricultural advantages. In the Bitter Root valley, called the Garden Valley of M., apples, plums, and potatoes of rare size and quality are raised, and small-fruits thrive everywhere, giving an enormous yield. Stock-raising comes next to mining as an industry, on account of the vast extent of land peculiarly adapted to grazing rather than tillage. Within recent years there has been an immense investment in stock brought into M., as well as shipment of stock to the great markets of the United States. The recent estimates of stock (1894) have been: cattle 1,056,952; sheep 2,780,908; horses 196,519. The losses of stock 1886-7 gave a new impulse to regular farming. The yield in the summer following of the chief crops was as high as 80 bushels per acre of oats, 65 wheat, 40 corn, and 200 to 300 potatoes; with an abundant crop of small-fruits. Wheat and oats are the cereals best suited to the climate and soil. Both the bench or upper and the bottom lands of the e. part of the state are equally susceptible to cultivation, subject to conditions of season and locality, and productive of wheat and all the more hardy vegetables. Irrigation is conceded to be of urgent and universal importance, and with the sunshine and air of M. a sure means of making the state the garden of the continent. In 1900 M. had 13,370 farms, comprising 11,844,454 acres, of which 1,736,701 were improved and 10,107,753 unimproved; and the property, including buildings, implements, and machinery and live stock was valued at \$117,859,823.

Manufactures.—Manufacturing development in M. has only begun. In 1900 there were reported 1,080 manufacturing establishments, employing \$40,945,846 capital and 10,117 persons, paying \$7,969,886 in wages, and \$32,702,650 for raw materials, and having an annual output valued at \$57,075,824. Refining and smelting of copper and lead, saw-mills for lumber and grist-mills for flour have been of chief importance, after quartz-mills, reduction furnaces, and ranches.

Commerce.—The chief shipments are of cattle, hides, pelts, furs, wool, and the products of the mines, the first and the last of a bulk and weight demanding very large railroad facilities. The shipments into M. of choice cattle from Ohio, Ill., Io., and other cattle-raising states have been very large, for the stocking of thousands of ranches, but especially those owned by 10 or 12 great companies. The amount of merchandise of all kinds carried into M., to meet the wants of a peculiar commu-

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nty, has been very large. It was at first by way of the Columbia and the Missouri rivers, and the hardest possible teaming over mountain roads; but railway facilities are now added, providing for a large volume of trade.

Railroads.—M. had 1882, Jan., 232 m. of railroads in operation. The Northern Pacific, started 1863, reached the e. border of M. 1880; and 1883, Aug., the two e. and w. sections of it met 50 m. w. of Helena, with 787 m. of its trunk-line within the state, and branches of 50 m. and 20 m. completed, to the National Park and to Wickes. In addition, about 200 m. of the Union Pacific branch from Ogden, Utah, to Garrison, on the Northern Pacific, were in operation in M., and there was a branch at Butte. In 1887, the St. Paul Minneapolis and Manitoba railroad entered M. and built 404 m. to Great Falls. The Montana Central also built from Great Falls to Helena, 102 m., and thence toward Butte 80 m. distant. The year's increase in mileage was 626 m. In 1888 the gov. could say: 'Ten years ago there were but a dozen m. of railroad, now there are over 2,000.' There were (1889) in M. 781·9 m. of the main line of the Northern Pacific and 217·3 of its branches; 408 m. of the St. Paul Minneapolis and Manitoba; 193·7 m. of the Montana Central; 44 m. of the Montana Union; and 140 m. of the Union Pacific, besides 283 m. in course of construction—giving a total of 2,068 m. In 1901 there were 3,050 m. of railroads in operation.

Religion.—As early as 1880 almost every settlement had a religious society, every village a newspaper, and nearly every town two or more churches. Missionaries made great efforts to establish schools at the Indian agencies, and Rom. Cath., Meth. Episc., Congl., and Prot. Episc. ministers were self-sacrificing and devoted in efforts to plant social and religious order. Recent statistics show: Meth. Episc., 8 churches, 6 ministers, 675 members; Meth. Episc. South, 9 ministers, 232 members; Christians (Disciples), 6 churches, 4 ministers, 675 members; Rom. Cath., 10 churches, 13 priests; Presb., 6 churches, 7 ministers, 194 members; Congl., 4 churches, 4 ministers, 233 members; Prot. Episc., 8 churches, 300 members. With the rapid planting of new towns, churches are multiplying.

Education.—The pop. of school age (1877) was 4,271; number attending school 2,734; sum spent on schools \$35,287; (1880) pop. of school age 7,070; number in schools 4,667; sum spent \$68,002. Over 90 schools were organized, and Helena, Deer Lodge, and Virginia City had graded schools. The support for all schools was a tax of not less than three nor over five mills on all property. All the larger places further taxed themselves, and had provided themselves, 1883, with good school-houses, while seven large graded school-buildings of the first class were in course of construction. The number of schools kept was 203; of children attending, 6,923 out of 12,425 of school age. In 1895 the number of school-children was 35,220, of whom 17,790 were males and 17,430 females. The average daily attendance was 18,051;

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the number of teachers employed 878; value of school property \$1,741,596; amount of tax raised for schools \$317,442. There has never been lack of generous interest in education; and the wages paid teachers have been more liberal than in any other state or terr. The act admitting M. to the Union assigned section 16 and 36 in each township to be sold at not less than \$10 an acre, to create a fund for support of the public schools. Thus one-eighteenth of all the land of the state is devoted to this purpose—5,182,720 acres. The same act appropriated also for a state univ. 46,080 acres; agricultural coll. 140,000 acres; school of mines 100,000; normal school 100,000; deaf and dumb 50,000; reform 50,000. The school fund will receive also five per cent. of the net proceeds of public lands sold within the state by the United States.

M. has (1902) 89 newspapers and periodicals, of which 11 are daily, 4 semi-weekly, 68 weekly, 1 semi-monthly, 2 tri-weekly and 3 monthly. Only one has a circulation over 5,000, the *M. Farming and Stock Journal* at Helena (weekly).

Illiteracy.—Persons 10 years old and upward enumerated (1890) 107,811, whites unable to read and write 4,232; foreign-born whites unable to write 3,212. In 1880 there were 2,060 white persons of 10–14 years old, unable to write 55, males 28, females 27; whites 15 to 20 years old 2,615, unable to write 51, males 35, females 16; whites 21 years old and upward 24,311, unable to write 525, males 410, females 115; colored persons 10 years old and upward 3,003, unable to write 1,076; colored 10–14 years old 268, unable to write 138, males 86, females 52; colored 15–20 years old 354, unable to write 161, males 83, females 78; colored 21 years old and upward 2,381, unable to write 777, males 1,908, females 294.

Finances and Banking.—The valuation of property (1875) was \$10,062,904; (1880) \$18,609,802; (1885) \$52,847,536; (1902) \$185,725,657. The tax rate (1902) was \$2.50 per \$1,000. In 1893 there were 26 national banks, with capital \$3,375,000, and 4 state banks, capital, \$365,000; (1883) nat. banks 9, private 16, 4 of the national being at Helena, with a combined capital of \$875,000. and deposits aggregating \$4,300,000. In 1902 M. had 23 national banks in operation, with \$2,480,000 capital; 23 State banks, \$1,185,000 capital; 21 private banks, \$651,008, and 4 loan and trust companies.

History.—The n.w. part of M., beyond the main divide of the Rocky Mountains, formed the n.e. corner of the 'Oregon country,' secured to the United States by treaty with Great Britain 1846. The part e. of the main divide of the mountains formed the extreme n.w. of Louisiana, the vast territory reaching from the mouth of the Mississippi n. and w. to the Rocky Mountains, which France sold to the United States under Jefferson's presidency, 1803, Apr., for \$15,000,000. Jefferson at once sent off the Lewis and Clarke exploring expedition, which, after delays, started from St. Louis in the spring of 1804, wintered 1804–5 about 40 m. above the present site of Bismarck, N. Dak., and going on 1805. Apr. 7, up the Mis-

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souri river, reached the Great Falls in central M. July 15; and Sep. 22 crossed the main divide of the mountains and n.w. M. to a tributary of the Columbia, and thence by the Columbia to the Pacific; whence they returned the next year, 1806, March, from the mouth of the Columbia, over the mountains, on horseback in May, across the present M. in July and Aug., reaching St. Louis in Sep. The next year Lewis was made gov. of Louisiana, which had been made a U. S. terr. 1805, with St. Louis as capital. In 1812, upon the admission of the state of Louisiana, the terr. was called Missouri, and since that date the whole or parts of it have fallen within various territories, until 1864, May 26, it was set off from Idaho Terr. as the terr. of M. By act of 1873, Feb. 17, a tract of about 2,000 sq. m. was added to M. at its extreme s.w. corner, on account of its inclusion with it by the mountains, and the close connections which had resulted from this fact. The early cap. of M. was Virginia City; since 1875 Helena.

The few settlers which M. had before the discovery of gold 1861 were hunters, trappers, and missionaries. It was a favorite hunting-ground, and Fort Benton was a seat of the fur-trading interest. The early comers were, many of them, desperate characters, and social order was very uncertain until energetic Vigilance measures were adopted for suppressing disorder. The opening of railroads, the rapid growth of cities and towns, and the movement to become a state, have brought a new condition of things, fully representing order and progress of every kind as well as material prosperity. The constitutional convention to prepare for seeking admission to the Union sat 1884, Jan. 14—Feb. 9, and the constitution framed by it was ratified Nov. 4 by a popular vote of 15,506 against 4,266. Admission to the Union under this was not secured; but 1889, Feb. 22, an act of congress to admit M., N. Dak., S. Dak., and Wash., was signed by Pres. Cleveland; July 4th a duly called convention met at Helena and framed a state constitution; Oct. 1 this was adopted by popular vote, 24,676 against 2,274, and a state govt. was elected under it; and Nov. 8 Pres. Harrison by proclamation declared M. one of the states of the Union.

A large proportion of M. is taken up by Indian reservations. S. of the Yellowstone is that of the Crow tribe and the Crow agency; in the w. are the Flatheads and Bannacks; in the n. and e. are the Blackfeet, Pends d'Oreilles, Gros Ventres, Assiniboins, Piegans, and Sioux. The disappearance of the large game deprives these hunting-grounds of their chief value to the Indians. Nearly two-fifths of the terr. in 1883 was reserved to 18,000 Indians, some of whom were away in Canada, some thieving all over M., and some making advances toward settled self-support. Three reservations in 1885 embraced 45,000 sq. m., including nearly 30,000,000 acres of the finest grazing and agricultural lands. An act of cong. 1888 redeemed over 20,000,000 acres from Indian ownership.

MONTANIC—MONTANIST.

Government.—The executive of M. consists of a gov., lieut.gov., sec. of state, atty.gen., treasurer, auditor, and supt. of public instruction, chosen to serve for four years. The legislature consists of a senate whose members (16) are chosen for four years, and a house of representatives (55) to serve two years. The judiciary consists of a supreme court, of three judges elected by the people to serve six years, and of a supreme-court clerk, district-court judges, county attorneys, and justices of the peace elected by the people. Women who are tax-payers have equal right with men to vote on any matter submitted to tax-payers, and they are eligible to hold county, school, or school-district office, and may vote at any school-district election. The gov's. of M. have been: 1864-5 Sidney Egerton; 1865-6 (acting) Francis Meagher; 1866-69 Green Clay Smith; 1869-70 James M. Ashley; 1870-81 Benjamin F. Potts; 1882-3 J. Schuyler Crosby; 1884-5 B. Platt Carpenter; 1886-7 S. T. Hauser; 1888-9 Preston H. Leslie; 1889-93 Joseph K. Toole; 1892-97 John E. Rickards; 1897-1901, Robert B. Smith; 1901— Joseph K. Toole.

Counties, Cities, and Towns.—In 1880 the most populous *counties* were: Deerlodge 8,876; Lewis and Clarke 6,521; Madison 3,915; Gallatin 3,643; Choteau 3,058; and Meagher 2,743; *cities and towns*: Helena 3,624; Butte City 3,363; and Deerlodge 941. In 1890 the leading *counties*, including 5 new ones, were: Silverbow 23,744; Lewis and Clarke 19,145; Deerlodge 15,155; Missoula 14,427; Cascade 8,755; Park 6,881; Gallatin 6,246; Jefferson 6,026; Meagher 4,749; Choteau 4,741; and Madison 4,692; *cities and towns*: Helena 13,834; Butte City 10,723; Great Falls 3,979; Anaconda 3,975; Missoula 3,426; Livingston 2,850; and Bozeman 2,143.

Politics.—The first state govt. (1889-92) was republican in all officers except gov., who was democratic. The senate had eight of each party, and the lower house was reported by the returning board 30 repub. and 24 dem. with a tie in one district, while the returns of Silver Bow co. were disputed by the dem. party. M. has voted by a democratic majority 1878-89, with the exception of a large republican majority 1888, and the contested vote 1889, which was decided by the supreme court of M. in favor of the republicans. In 1900 M. gave a plurality vote of 11,773 for Bryan and Stevenson over McKinley and Roosevelt, for pres. and vice-pres. The state legislature has (1903) 243,320 in the senate, 13 reps., 12 dems., and 1 lab.; in the house, 45 reps., 8 dems., and 9 lab.

Population.—(1870) 20,595; (1880) 39,159, white 35,385, col. 3,774, incl. 1,765 Chin. and 1,663 Ind.; (1886) 120,000; (1887) 130,000; (1890) 132,159; (1900) 243,329.

MONTANIC, a. *mōn-tān'ik* [*L. montānus*, dwelling upon the mountains—from *mons*, a mountain]: pertaining to or consisting of mountains.

MONTANIST, n. *mōn'tān-ist*: a follower of *Montanus* (q.v.), a Phrygian heretic of the 2d c. **MON'TANIS'TIC**, a. *-is'tik*, pertaining to the doctrines of Montanus. **MON'TANISM**, n. *-izm*, the tenets of Montanus.

MONTANT—MONTANUS.

MONTANT, n. *mōn'tānt* [F. *montant*—from *monter*, to mount—from L. *mons*, a mountain]: a term in feneing; any upright piece in framework.

MONTANUS, *mōn-tā'nūs*: a heresiarch in the early Christian Church: a Phrygian by birth, who appeared about 160 at Ardabar, on the confines of Phrygia and Mysia. He was brought up in heathenism, but embraced Christianity with all the fanatical enthusiasm for which his countrymen were noted.—M.'s *theory* was the exact opposite of that of the Gnostic sects; yet, in *practice*, it led to a similar exclusiveness and sectarianism. He believed in the constancy of supranatural phenomena *within* the church: the miraculous element, particularly the prophetic ecstasy, was not removed; on the contrary, the necessity for it was greater than ever. He considered those only to be true or perfect Christians who possessed the inward prophetic illumination of the Holy Spirit—they were the true church; and the more highly gifted were to be regarded as the genuine successors of the apostles, in preference to the mere outwardly consecrated bishops. Thus, they formed a religious aristocracy, as arrogant as the Gnostics; the difference between the two being, that the Montanists prided themselves on a kind of inflamed inspiration, and the Gnostics on a calm and serene illumination of the reason. Neither party wished to recede from the Cath. Church, but rather to exist as an esoteric body within its pale. It was persecution, caused, no doubt, by their own insolent obstinacy, that forced them into a sectarian organization. M. did not meddle directly with the creed of the church; he was not a thinker, nor a man of much importance intellectually. His efforts were confined to stirring up the Christians generally to what he deemed fresh religious life—to a belief in a fresh outpouring of the Holy Spirit. At first, M. contented himself with predicting fresh persecutions, exhorting men to greater strictness and holiness of life, and announcing judgments to come upon the persecutors; but his idea of his own mission afterward became more exalted, and he claimed to be in a very special sense a prophet of God—the organ chosen by the Holy Spirit to purify, enlighten, and advance the church. Among the things on which the Montanists laid stress was an ascetic mode of life, scorn of persecution, and love of martyrdom; connected with these, and, indeed, flowing from them, was an aversion to second marriages and to the restoration of the LAPSED (q.v.). Like other enthusiasts, they were firm believers in the near approach of the Millennium (q.v.) and in the visible bodily advent of Christ. Two 'prophetesses,' Priscilla and Maximilla, were associated with M. in his work. A decree for the expulsion of M. and his followers from the communion of the Cath. Church was issued by Eleutherus, bp. of Rome. The Montanists at once proceeded to organize themselves as a distinct sect. They found a singularly able apologist in Tertullian (who became a Montanist about 200), and they continued to exist till the 6th century.

MONTANUS—MONT BLANC.

MONTANUS, ARIAS: see ARIAS MONTANUS.

MONTARGIS, *mōng-târ-zhē'* or *-zhēs'*: town of France, dept. of Loiret, at the junction of the canals of Orleans and Briare with that of Loing, 40 m. e.n.e. of the city of Orleans. M. has some cloth and leather manufactures, and considerable trade in corn, cattle, etc. In its vicinity is the extensive forest of M.—Pop. (1891) 11,600.

MONTAUBAN, *mōng-tō-bōng'* (Lat. *Mons Albanus*): town of France, cap. of the dept. of Tarn-et-Garonne; in a rich and beautiful country, on a plateau between the rivers Tarn and Tescou, 32 m. n. of Toulouse. It is the seat of a bishop, and has a fine cathedral in the Italian style, finished 1739, on the site of an older monastery, the *Mons Aureolus* (Golden Hill). M. is a well-built, handsome town: the houses are mostly of brick. Besides having considerable manufactures, it has great trade in wine, grain, leather, etc.—M. was founded 1144 by Count Alphonse of Toulouse, became the seat of a bp. 1317, embraced the Reformation 1572, and suffered severely in the civil wars that ensued. It has acquired historical celebrity as the great stronghold of the Huguenots. Protestantism still is strong, and maintains both an acad. and a theol. college. Pop. (1881) 20,840, nearly one-half Protestants; (1886) 22,431; (1901) 30,506.

MONTAUK POINT, *mōn-tawk'*: elevated headland, the extreme eastern point of Long Island, and belonging to East Hampton township, Suffolk co., N. Y. It was the home of the Montauks, a fierce tribe of Indians, about a dozen of whose descendants remain. M. P. is the end of a fine high grassy plateau furnishing pasturage for thousands of cattle. On a bluff about 70 feet above the sea, the govt. has erected a stone light-house 110 ft. high, which flashes a white light once in two minutes and can be seen 36 m. at sea. This was the first Fresnel light used in America.

MONTBÉLIARD, *mōng-bā-lyâr'* (Ger. *Mömpelgard*): town of France, dept. of Doubs, 36 m. n.e. of Besançon. It lies in a valley between the Vosges and Jura Mountains, is surmounted by an old chateau, now used as a prison, and has manufactures of cotton goods, hosiery, and silks. Clocks, watches, and agricultural implements also are made. Pop. (1886) 9,055; (1891) 9,168.

MONT BLANC, *mōng blōng'*: highest mountain in Europe; according to the latest measurements, 15,781 ft. above the level of the Mediterranean Sea; one of the Graian Alps. It is in the dept. of Haute-Savoie, France, close to the Italian frontier, 37 m. s. of the e. end of the Lake of Geneva. The vales of Chamouni and Montjoie lie on the w., and those of Ferret and Allée Blanche on the e. side of it. The waters from its w. slopes are drained off to the Arve, thence to the Rhone; while those which rise on the e. are feeders of the Dora Baltea, tributary of the Po. It has 3 snow-clad peaks and 36 glaciers, of which 16 are on the north and 20 on the south side. The highest summit is a narrow ridge 50

MONTBRISON—MONT CENIS.

yards by 16, called *La Bosse du Dromedaire*, covered with firm snow, and very steep toward the north. In 1760, Saussure offered a prize for the discovery of a practicable route to the summit of M. B., which was gained 1786, June, by Jacques Balmat, a guide. Saussure himself ascended the mountain the following year; and the same feat has since been performed by many, especially since Albert Smith published the well-known pictorial and dramatic description of his ascent in 1851.

MONTBRISON, *mōng-brē-zōng'*: town of France, cap. of the dept. of Loire, 37 m. s.w. of Lyon, at the base of a lofty rock. Pop. 6,235.

MONTCALM DE ST. VÉLAN, *mōnt-kâm'*, F. *mōng-kâlm' déh sāng rā-rōng'*, LOUIS JOSEPH, Marquis DE: 1712, Feb. 28—1759, Sep. 14; b. near Nîmes, France. He was a soldier from the age of 14 years, when he entered the French army; was made capt. at 18; served with distinction in Italy 1734; in Germany during the war for the Austrian succession; and again in Italy, where he was wounded at Piacenza 1746, and was promoted col. At the opening of the French and Indian war in America, he was sent to Canada 1756, May, to take command of the French troops there. He took Fort Ontario at Oswego, and Fort William Henry on Lake George, from the English. In 1758 he occupied and strengthened Ft. Ticonderoga (Carillon), and awaited, with his 3,600 Canadian volunteers, the attack of Gen. Abercrombie at the head of 15,000 British. In a fierce battle, July 8, the latter were forced to retreat. Lack of provisions and ammunition, and improper support from the home govt., obliged him 1759 to withdraw his forces to the defense of Quebec, on which depended the French dominion in America, and which was threatened by Gen. Wolfe with an army of 8,000 men and a fleet on the St. Lawrence. M. concentrated his force on the Montmorency, and when attacked by Wolfe, July 31, he promptly drove him back with heavy loss; for 6 weeks afterward the British besieged him in vain. Then Wolfe conceived and carried out the bold plan of scaling the cliffs, from the river, above Quebec. This he did in the night of Sep. 12, and the next morning revealed his entire army drawn up on the plains of Abraham, in the rear of the French. M. promptly prepared to meet the unexpected foe. At 10 A.M. the battle opened; M. led his men in person; but the deadly fire of the British threw them into confusion; then the British charged, driving their opponents in every direction. M., though wounded, bravely tried to rally some of his volunteers, when a ball struck him, inflicting a mortal wound, almost at the same time when Wolfe too received his death-blow and was carried off the field. M. died the next morning, and several days afterward Quebec surrendered, and Canada was lost to France. A monument was erected in Quebec 1827 to the memory jointly of M. and Wolfe.

MONT CENIS, *mōng seh-nē'*: see CENIS, MONT: TUNNEL.

MONTCLAIR—MONT DE PIÉTÉ.

MONTCLAIR, *mōnt-klār'*: town and tp. in Essex co., N. J.; on the Delaware Lackawanna and Western and the New York Lake Erie and Western railroads; 5 m. n. of Newark, 13 m. n.n.w. of New York. It is on the e. slope of the Orange Mountains, 650 ft. above tide-water, and commands magnificent views of the country extending to New York city and bay. It has been built up mainly by New York business men; is provided with road macadamized and gravelled roads extending through its suburbs; has several superior private and public schools, 8 churches, public library, and superb residences; and is a charming place of suburban residence. Watchung, Upper Montclair, and Montclair Heights are extensions of M. proper, and all are supplied with excellent water. Among the attractions are splendid drives to the famous Eagle Rock, Camp Washington, Passaic Falls, Little Falls, and Verona Lake. Pop. (1880) 5,147; (1901) 8,656; (1900) 13,962.

MONT-DE-MARSAN, *mōng-dēh-mâr-sōng'*: town of France, cap. of the dept. of Landes, 65 m. s. of Bordeaux. Pop. about 10,700.

MONT DE PIÉTÉ, n. *mōng' dē pē-ā-tā'* [F. mount of piety: It. *monte di pietà*]: charitable institution, frequently managed by the govt., the object of which is to lend money to the very poor at moderate interest. It had its origin at the close of the mediæval period, when all such transactions were in the hands of usurers, to whom the necessities of the poor were an inducement to the most oppressive extortion. Its originator was Francisco de Viterbo, a Minorite friar at Padua. He appears to have procured the sanction of the pope's bull for the founding of the earliest of these charitable banks at Padua 1491, which was so successful as to lead, according to contemporary writers, to the closing of the Jewish banks in that city. The first opened at Rome was under Leo X.; and the Roman Monti di Pietà are confessed to have been at all times the most successful and the best managed in Italy. The institution extended to Florence, Milan, Naples, and other cities. The principle of all was to advance small sums on the security of pledges, but at a rate of interest barely sufficient to cover the working expenses. Should any surplus remain, it was to be expended for charitable purposes. The mont of Milan, nearly 500 years old, formed by union of 36 private concerns, had (1333) a capital of 671,000 Austrian livres. The Mont de Piété system was introduced into Spain, France, Belgium, Germany, the Netherlands, and Russia. In 1373 there were in France 46 Monts de Piété, making yearly loans of 60,000 francs: the most important are at Paris, Lyons, and Marseilles. The M. de P. formed the model of the loan fund board of Ireland. The system has never been successfully introduced into Britain, and is not known to have been attempted in the United States. See PAWNBROKING.

MONTE—MONTECUCULI.

MONTE, n. *mōn'tā* [Sp. the stock of cards that remains after each player has received his share; L. *mons*, a mountain]: a gambling game played with cards or dice. **MONTE-BANK**, n., a gambling-house where monte is played.

MONTEBELLO CASTEGGIO, *mōn-tā-bēl'lō kās-tēd'jo*: village of n. Italy, province of Pavia, 23 m. e.n.e. of Alessandria; in a plain on the banks of the torrent Schizzola. Here the Austrians were defeated by a French army under Gen. Lannes, after a desperate conflict, 1800, June 9. The title Duke of Montebello was conferred on the victorious French gen. five years later. 1859, May, the Austrians were again defeated here by the united armies of the French and Piedmontese.

MONTE CARLO, *mōn'tā kâr'lō*: small town in the territory of Monaco (q.v.), close to the town of Monaco; notorious for its gaming-tables.

MONTE CASINO: see **CASINO**, **MONTE**.

MONTE-CATINI, *mōn-tā-kâ-tē'nē*: village of Tuscany, on a spur of the Apennines, 29 m. w. of Florence. In the vicinity are the famous mineral springs of M.-C., in high repute for curative properties, especially in diseases of the liver and digestion. Excellent accommodation can be had by visitors both in private establishments and those under govt. direction.

MONTE CHIARO, *mōn'tā kē-â'rō*: town of n. Italy, province of Brescia, on a height on the left bank of the Chiese, in the centre of an amphitheatre of hills. The chief manufacture is silk. In 1796, the Austrians were defeated here by a French army.—Pop. 6,933.

MONTE CHRISTO, *mōn'tā krēs'tō*: small island belonging to Italy, 26 m. s. of Elba. It consists of a mountain of granite 1,983 ft. above sea-level, and is uninhabited except by wild goats and other animals. It is inaccessible except by one narrow landing-place. M. C. has given name to Dumas's well-known novel.

MONTECUCULI, *mon-tā-kô'kô-lē*, **RAIMONDO**, Count of, Prince of the Austrian empire, and Duke of Melfi: 1608–1680, Oct. 16; b. at the castle of Montecuculi, Modena. He entered the Austrian artillery as a volunteer under his uncle, Ernesto, Count Montecuculi, 1627. During the Thirty Years' War he found many opportunities of distinguishing himself, received rapid promotion, and was employed in various services, military and diplomatic. In 1657, he was sent to support the King of Poland, John Casimir, against the Swedes and Rákóczy, which he did with great effect, compelling Rákóczy to make peace with Poland, and to break his alliance with the Swedes. In the following year, he was made a field-marshal, and was sent to aid the Danes against the Swedes, in which also he was eminently successful. In 1660, he commanded the army sent to oppose the Turks, who had broken into Transylvania, and skilfully kept them in check till the arrival of the French, with whose

assistance he won the great battle of St. Gotthard, on the banks of the Raab, 1664, Aug. 1—the first decided triumph of European tactics and discipline over the mere numbers and daring of the Ottoman hosts. When the war broke out between France and Holland, in which the emperor took part with Holland, M. received the command of the imperial army 1672. He took Bonn, and, notwithstanding the endeavors of Turenne to prevent it, effected a junction with the Prince of Orange. In 1675, he was opposed to Turenne on the Rhine, and they spent four months in manœuvres in which neither could gain any advantage. After this campaign, M. spent the remainder of his days at the imperial court and in the society of learned men. He was himself a man of learning and various accomplishments, and has left works on the art of war, on the Turkish war, and on the war of 1664, also sonnets. Emperor Leopold made him a prince of the empire, and the King of Naples bestowed on him the duchy of Melfi. He lost his life by the fall of a beam as he was entering the castle at Lintz with the imperial court. His writings were published in the original Italian by Ugo Foscolo (2 vols. Milan 1807), and by J. Grassi (2 vols. Turin 1821). See Campori, *M., la sua Famiglia e i suoi Tempi* (1877).

MONTEFIORE, *mon-tā-fē-ō'rā*, Sir MOSES: renowned Jewish philanthropist: 1784, Oct. 24—1885, July 29; b. London; descendant of a wealthy family of bankers. He was prominent in the struggle for removing the civil disabilities of English Jews (see JEWS). He was for a time high sheriff of Kent; and after long exclusion and repeated re-election, was legally admitted as sheriff of London. While acting in this capacity he was knighted 1837, and afterward raised to a baronetcy 1846, in recognition of his meritorious public services. He distinguished himself by his practical sympathy with his oppressed countrymen in various parts of the East, chiefly in Poland, Morocco, and Turkey; and at different times he undertook missions on their behalf, visiting Damascus 1840, Roumania 1867, and Jerusalem 1875. He was presented with the freedom of the city of London 1873. In memory of his wife he endowed a Jewish college at Ramsgate 1867. In his 100th year he was still hale and well, but died in the following year. He had a clear and active mind, with great practical wisdom and executive force. His high integrity, his devout but broadly tolerant religious spirit, and his genial disposition, were as notable as was his public beneficence.

MONTEGO BAY, *mōn-tē'gō*: small but flourishing seaport on the n. coast of the island of Jamaica, 17 m. w. of Falmouth. It has a harbor protected by a breakwater, is defended by a battery, and carries on a general trade of some importance. More than 100 vessels annually enter and clear the port. Pop. variously stated, 4,000 to 5,000.

MONTTEITH—MONTÉLIMAR.

MONTTEITH, n. *mǒn-lēth'*, or MONTETH, *mǒn-tēth'*: vessel for cooling or washing wine-glasses; called by the name of its inventor.

MONTEJO, *mon-tā'cho*, FRANCISCO DE: 1479–1549: Spanish soldier. He sailed for the Spanish main with the expedition of Davila 1514; but deserted on arriving at Nombre de Dios, and went to Cuba. He commanded the expedition to Yucatan 1518; was with Cortes in the conquest of Mexico; and was appointed gov. of Vera Cruz 1522. Returning to Spain, bearer of dispatches from Cortes, 1526, he was commissioned to effect the conquest of Yucatan, and sailed from Seville 1528, in command of 500 men. After 12 years of constant warfare, he was master of Yucatan. Recalled to Spain, to answer charges, he died there.

MONTTEJUS, n. *mawngt'-zhü* [Fr.]: force-pump for raising the juice in a cane-mill to the clarifiers on the floor above.

MONTELEONE DI CALABRIA, *mǒn-tā-lā-ō'nā dē kâ-lâ' brē-â*: city in Italy, so called to distinguish it from Monteleone in Apulia. It is in the province of Catanzaro, on the w. side of the Bruttian peninsula. It was almost totally destroyed by earthquake 1783, and for years afterward consisted mainly of slight wooden erections; but during the French occupation it was cap. of a province, and the headquarters of Gen. Regnier: it then revived, and is now a well-built town. It contains a castle built by Roger, Count of Sicily. Pop. about 12,000.

MONTÉLIMAR, *mōng-tā-lē-mâr'*: ancient town of France, dept. of Drôme, about 2 m. from the left bank of the Rhone, 26 m. s. of Valence. It stands on the slope of a hill covered with vineyards. There are factories for silk and cotton goods, tan. etc. Pop. (1891) 9,183.

MONTM—MONTENEGRO.

MONTM, n. *mõn'tëm* [L. *mons* or *montem*, a mountain]: ancient custom among the scholars of Eton School of making a triennial procession on Whit-Tuesday, to a certain mound (*ad Montem*) known as the Salt Hill, near the Bath Road, and which was doubtless so called because certain of the boys levied tribute (for salt, as the phrase went) from every person present, and even from any chance passer. These juvenile tax-gatherers were attired in fancy dresses of silk. The king and queen, besides many members of the nobility, frequently honored the procession with their presence; and on such occasions, as much as £1,000 has been collected, which was given to the senior scholar to support him at Cambridge. The origin of the custom is unknown. It was discontinued 1847.

MONTENEGRO, *mõn-tā-nā'grō* (often pronounced and sometimes written **MONTENERO**; Italian translation of the native name **CZERNAGORA**, 'Black Mountain'): small but independent and recently extended principality between Bosnia and Albania. Till 1878 it had an area estimated from 1,669 to 1,796 sq. m., and was separated from the Adriatic by a narrow strip of foreign territory; but the Berlin Conference assigned to M. the port and dist. of Antivari, while closing it against the war-ships of all nations. Toward the end of 1880, the port and dist. of Dulcigno (q.v.), heretofore Albanian, became Montenegrin. The latter place Turkey agreed to cede instead of an inland district indicated by the Berlin Conference; but the persistent delay of the Porte to transfer Dulcigno led to strong pressure and a naval demonstration by the western powers. Area of M. about 3,680 sq. m.; pop. about 228,000.

The country, traversed by branches of the Dinaric Alps, is very mountainous, the highest points being Dormitor in the n. (8,146 ft.), and Kom Kutchi in the e. (8,031). In the e. and s., the hills are partly clad with forests. But the higher ridges and plateaus are bare of vegetation; and being generally covered with loose masses of rock, give to M. an aspect of peculiar sterility and desolation. Yet the valleys are highly fertile; those of the Moratscha and Zeta, with the low land on the Lake of Scutari (into which the chief streams of M. debouch), form the granary of the land. The climate of the hill country, which is M. proper, is ungenial; that of the great valley and its connected region is delightful. The fisheries of the lake are productive. Agriculture is carried on wherever practicable. The exports, which may be valued at about \$1,000,000, consist mainly of hides, wool, sheep, smoked mutton and bacon, sumach, cheese, and fruit; but as there are hardly any roads other than mere tracks, exports and imports alike have to be conveyed on the backs of mules, or of porters, usually women. The cap. of M., Cettigne or Cetinji, is a village of 2,514 inhabitants. The chief towns, mostly in the newly acquired territory, are Antivari (2,514), Podgoritza (6,534), Dulcigno (5,000), Niksik (3,500), Danilograd (1,500), Spuz, Zabliak, Kolasin.

MONTENEGRO.

The Montenegrins or Zrnagorzes are Slavs of the Serbian stock, and constitute almost the whole population of the country, the exception being some Albanians and others in the new territory. The natives are handsome, athletic, and very hardy. They have many noble characteristics; their morals are pure, and their family affection strong. They are brave and patriotic, but somewhat reckless, passionate, and fierce. Their modes of warfare, formerly savage, have yielded to civilized methods. Their clan system lends itself to the perpetuation of close alliances and bitter feuds, and the hereditary obligation to avenge blood is fully recognized.

The constitution of the country is usually called limited monarchy; probably it would be safer to speak of it as an absolute hereditary monarchy, in which the council of state and the national assembly have considerable influence on the decisions of the prince. The head of the govt. 1516–1851 was the *Vladika* or prince-bishop, who, besides his proper office as ecclesiastical superior, exercised at the same time those of chief ruler, lawgiver, judge, and military leader. In 1851, the two offices were disjoined, and the vladika was restricted to his ecclesiastical office, while the cares of government were left to the *Gospodar* (hospodar) or prince. Since 1879 the state council consists of eight members, of whom half are appointed by the prince. The country is now divided into 80 districts and four military commands. Besides this, there exist the time-honored patriarchal institutions. An ‘elder’ presides over each village community; these small communities constitute 40 or more tribes or clans, each of which has again an ‘elder’ at its head; and groups of allied clans choose a *knjas*. All these various local dignitaries come together to form the *Skupschtina* or national assembly.

The language of the Montenegrins is a very pure dialect of the Servo-Illyrian Slavonic. With the exception of 7,000 Rom. Catholics and 3,000 Mohammedans in the new territory, the Montenegrins belong to the orthodox Greek Church. There are about 2,000 Montenegrins scattered in Austria, Turkey, and Russia; besides small Montenegrin colonies in Alexandria and San Francisco.

The public income amounts to about \$1,500,000, and exceeds the expenditure. The public debt was paid off by Russia 1876. The prince’s civil list includes \$1,750 from home sources, \$7,000 from Russia, and \$10,000 from Austria. Except the body-guard of the prince, there is no standing army. But as all the inhabitants are trained to arms, they form a permanent militia, and are easily transformed into an army of nearly 30,000 excellent soldiers. According to a plan of reorganization contemplated 1880, there would be a first ‘ban’ of 26,000 men, and a second ‘ban’ or reserve of 8,400.

Consult Andric, *Gesch. des Fürstenthumes M.* (1853); Dutschitsch, *Zrna Gora* (1874); Gopcevic, *M. et les Montenegrins* (1877); Denton, *M.* (1877).

History.—M. belonged in the middle ages to the great

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Servian kingdom, but after the dismemberment of the latter, and its conquest by the Turks at the battle of Kossovo (1389), the Montenegrins, under their prince, who was of the royal blood of Servia, maintained their independence, though compelled to relinquish the level tracts about Scutari, with their chief fortress of Zabliak, and confine themselves to the mountains (1485). In 1516, their last secular prince resigned his office, and transferred the govt. to the vladika. The Porte continued to assert its claim to M., and included it in the pashalik of Scutari; but the country was not conquered till 1714, and on the withdrawal of the Turks soon afterward, it resumed its independence. In 1710, they had sought and obtained the protection of Russia, the czar agreeing to grant an annual subsidy on condition of their harassing the Turks by inroads, and this compact has, down to the present time, been faithfully observed by both parties. Another part of the agreement was, that the archbishop or vladika was to be consecrated by the czar. In 1796, the prince-bishop, Pietro I., defeated the Pasha of Scutari, who had invaded M., with the loss of 30,000 men; and for the next quarter-century we hear no more of Turkish invasions. The Montenegrins rendered important aid to Russia 1803 against the French in Dalmatia, and took a prominent part in the attack on Ragusa, the capture of Curzola, and other achievements. Pietro II. (ruled 1830-51) made great efforts to civilize his people and improve their condition. He established the senate, introduced schools, and endeavored, though unsuccessfully, to put an end to internal feuds and predatory expeditions into the neighboring provinces. Some Turkish districts having joined M., the Turks attacked the latter 1832, but were repulsed. A dispute with Austria regarding the boundary resulted in a war, which was terminated by treaty 1840. In 1851, the last prince-bishop died, and his successor, Danilo I., separated the religious from the secular supremacy, retaining the latter under the title of Gospodar. This step caused Czar Nicholas to withdraw his subsidy (which was renewed, and the arrears paid, by Czar Alexander II.), and the imposition of taxes thus rendered necessary caused great confusion. This was taken advantage of by the Turks, who, under Omar Pasha, invaded the country; but the intervention of the Great Powers compelled a treaty 1853, Feb. 15. Danilo went in vain to the Paris conference 1857, seeking the recognition of M. as independent. In 1860, the Montenegrins excited an insurrection against the Turkish rule in the Herzegovina, which was soon suppressed, and in return they were so hard pressed by the Turks, that they were glad to agree to a treaty (1862), by which the sovereignty of the Sublime Porte over M. was recognized. Fresh complications caused M. to declare war against Turkey 1875, Jan., but a compromise was effected. M., however, supported the insurrection against Turkey that broke out in the Herzegovina a little later, and was again at war 1876, July.

MONTENOTTE—MONTEREY.

The Montenegrins co-operated with the Russians against their hereditary enemy during the war of 1877-8; and the Berlin Conference (1878) recognized the independence of M., and agreed to an important extension of Montenegrin territory.

MONTENOTTE, *mōn-tā-nōt'tā*: small village of n. Italy, 26 m. w. of Genoa. Here the Austrians were defeated by the French 1796, Apr. 12.

MONTEPULCIANO, *mōn-tā-pōl-chā'nō*: city of Italy, province of Siena, on a high hill, 56 m. s.s.e. of Florence. Numerous Etruscan remains have been excavated in the neighborhood. The wines of M. are famous. Pop. about 3,000.

MONTEREALE, *mōn-tā-rā-ā'lā*: town of s. Italy, province of Aquila, 14 m. n.w. of the town of Aquila. It stands on a hill in a great plain, and has several elegant churches. There are vast chestnut-groves near M., which furnish the poor inhabitants with the chief article of their subsistence. Pop. 5,014.

MONTEREAU, *mōng-tēh-rō'*: town of France, dept. of Seine-et-Marne, at the confluence of the Seine and Yonne, 46 m. s.e. of Paris, with which there is communication by steam-boat. The manufactures are earthenware and leather. Here, 1419, Jean-sans-Peur, Duke of Burgundy, was assassinated, at the instigation and in the presence of the dauphin, afterward Charles VII.; and in the immediate vicinity, Napoleon gained his last victory over the allies, 1814, Feb. 18. Pop. (1891) 7,479.

MONTEREY, *mōn-tē-rā'*: town in Monterey co., Cal., on the bay of M., 94 m. by land s.e. of San Francisco, 80 m. by sea. Under Mexican rule it was the cap. of Cal. The M. and Salinas Valley railroad furnishes inland transportation facilities, and there is a line of steamers to San Francisco. It has a large harbor somewhat exposed on the n., but protected on the s. Its light-house is on Point Pinos. M. has a beautiful location, and the numerous Mexican adobe houses with roofs of tile give it a quaint appearance. It is the home of a Rom. Cath. bp. The ruins of the Carmelite mission are a short distance from the town. Pop. (1880) 1,396; (1890) 1,662; (1901) 1,748.

MONTEREY, *mōn-tā-rā'*: the most thriving city of n. Mexico, cap. of the state of Nuevo Leon; on the San Juan, a tributary of the Rio Grande, 175 m. w. of Matamoras. It is well paved and clean, stands on a broad plain, 1,626 ft. above sea-level, and is surrounded by beautiful gardens and orchards. Pop. in 1880, 33,811. From its situation, its facilities for commerce are great; and it is the entrepôt for the transport of American goods from the Rio Grande to the inland states of Durango and Zacatecas. Pop. (1880) 33,811; (1890) 41,700; (1900) 62,266.

The **BATTLE OF MONTEREY**, 1846, Sep. 19-24, was fought between 6,600 American troops under Gen. Zachary Taylor, and 10,000 Mexicans commanded by Gen. Ampudia. Regarding M. as the key to the n. provinces of

MONTERO—MONTE SARCHIO.

Mexico, Gen. Taylor marched s. from Matamoras, where he had been reinforced, and arrived before M. Sep. 9. Finding the city strongly fortified, Taylor began his attack Sep. 19, by opening a heavy bombardment upon it from his batteries; followed by a successful assault on the lower part of the city by Gen. Quitman's brigade, at the same time that a regt. under Gen. Butler effected an entrance at another side. The Mexicans made a stubborn defense. Each strongly built house had to be separately assailed, and its occupants driven out, so that a running fight was kept up from street to street. On the second day Gen. Worth succeeded in storming the bishop's palace, occupying the hill w. of the city, and deemed almost impregnable. The Mexicans were finally driven into the main plaza of the city on the 23d, but did not surrender until the next day. The American loss was 120 killed and 368 wounded; that of the Mexicans is unknown. It was the first battle of the war won by the Americans, and greatly encouraged them.

MONTERO, n. *mōn-tā'rō* [Sp. *montera*—from *montero*, a huntsman—from *monte*, a mountain]: a kind of cap, properly a huntsman's cap, having a spherical crown, and a flap which could be drawn down over the ears.

MONTE ROSA, *mōn'tā rō'sā* (*Mons Sylvius* of the ancients): highest mountain in Europe after Mont Blanc. It is in the angle where the w. end of the Pennine meets the Lepontic Alps, and separates the canton of Valais from Italy. The n. portion of the mountain is highest, and forms nine peaks, the highest of which is forked and precipitous, 15,210 ft. above sea-level. Many attempts were made to ascend this peak, but none were successful till 1855. The mountain appears to consist of mica-slate, in some places alternating with gneiss. It is rich in metallic ores, and several mines of gold, copper, and iron are worked. The highest mine is between 10,000 and 11,000 ft. above sea-level, and in the region of perpetual snow. Rye ripens to an elevation of 6,000 ft.; and the vine is found as far up as 3,200 ft.; but there is a difference of nearly 1,000 ft. in the altitude of the corresponding vegetation on the n. and s. sides.

MONTE SAN GIULIANO, *mōn'tā sâ n jô-lē-â'nò*: town of the island of Sicily, province of Trapani, on a high mountain 4 m. e.n.e. of the town of Trapani. On the mountain (anciently *Eryx*) are the remains of a famous temple of Venus. Pop. 3,250.

MONTE SANT' ANGELO, *mōn'tā sânt ân'jâ-lō*: city of s. Italy, province of Foggia (formerly Capitanata), 28 m. n.e. of Foggia; on one of the Gargano group of hills, at a height of 2,790 ft., and has numerous fine churches. It is famed for exquisite honey, gathered from the odoriferous alpine plants of the mountain. Pop. 14,936.

MONTE SARCHIO, *mōn'tā sâr'kē-ō*: town of s. Italy, province of Benevento, 13 m. n.w. of Avellino, on the torrent Correo. Pop. 5,600.

MONTESQUIEU.

MONTESQUIEU, *mōn-tēs-kū'*, F. *mōng-tēs-ke-eh'*, CHARLES LOUIS DE SECONDAT (Baron DE LA BRÈDE ET DE MONTESQUIEU): philosophic historian: 1689, Jan.—1755, Feb. 10; b. at his father's château of La Brède near Bordeaux; descended from one of the most distinguished families of Guienne. In his youth he was a hard student of jurisprudence, literature, and philosophy. His love of the classical authors was so great, that at the age of 20 he composed a work intended to show that they did not deserve eternal damnation for being pagans. In 1714, he was appointed a counselor of the parliament of Bordeaux, and two years later, pres. of the parliament. His first (published) work was his famous *Lettres Persanes* (Par. 1721), in which, in the character of a Persian, he ridicules with exquisite humor, and clear, sharp criticism, the religious, political, social, and literary life of his countrymen. Although he did not spare the Academy in these *Lettres*, he was admitted a member of it 1728, and would have been admitted sooner, if Cardinal Fleury had not objected on the ground of his jests against religion. In 1726, M. resigned his office in the parliament of Bordeaux, and spent some years in foreign countries. In England, he spent two years, during which he was much in the company of Lord Chesterfield, and was treated with the greatest respect by the most distinguished personages. After his return to Brède, he published *Considérations sur les Causes de la Grandeur et de la Décadence des Romains* (Par. 1734), a masterly view of Roman history, expressed in a sententious, oracular, and vigorous style—the first important essay in the philosophy of history. It was followed, after a long interval, by his *Dialogues de Sylla et de Lysimaque* (Par. 1748), published under an assumed name, in which the motives and feelings of a despot are skilfully analyzed. In the same year appeared his great work, on which he had been engaged for 20 years, the *Esprit des Lois* (2 vols. Geneva 1748), aimed to exhibit the relation between the laws of different countries and their local and social circumstances. It was immensely popular. No fewer than 22 editions were published in 18 months, and it was translated into various European languages. The *Esprit des Lois* is a wonderfully good book, considering the age in which it appeared; by an excellent critic it has been declared 'one of the most important books ever written.' Certainly it is in its department one of the wisest. Without adopting Voltaire's hyper-eulogistic criticism, that 'when the human race had lost their charters, Montesquieu rediscovered and restored them,' it may be said that it was the first work in which the questions of civil liberty were ever treated in an enlightened and systematic manner, and to M., more than to any other man, is it owing that the science of politics has become a favorite subject of study with the educated public. It is interesting to note that M., before publishing the work, submitted it to a committee of his literary friends, six in number, some of much eminence, who unanimously, though with differing

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reasons, advised against its publication. It has been pointed out that the literary method as well as the thought of the *Esprit des Lois* is accordant more with English than with French standards: this may account for the fact that its popularity has always been greater in England and the United States than in M.'s own country. M. died at Paris. Of numerous editions of his works, by far the best is that by Édouard Laboulaye (7 vols. Par. 1875-79). See his Life by Louis Vian (2d ed. Par. 1879), and Dangeau's *M., Bibliographie des ses Œuvres* (Par. 1874).

MONTEVIDEO, *mōn-tē-vīd'ē-ō*, Sp. *mōn'tā-vē-tha'o*, SAN FELIPE Y SANTIAGO DE: city, capital of the republic of Uruguay, S. America; on the n. shore of the estuary of the Rio de la Plata (here 65 m. wide), and 132 m. e. by s. from Buenos Ayres, with which it has daily communication by an excellent line of steam-vessels. It stands on a small peninsula, and is surrounded by a wall and fortifications. The houses are mostly of one story, with flat roofs. Of public buildings worthy of notice are the cathedral, the town-hall, and the new market. The climate is healthful; but as there are no rivers near the town, water is scarce, and till 1870—when it was introduced by a new aqueduct 40 m. long—was obtainable only from wells, or by collecting rain-water in cisterns. The bay or harbor, about $3\frac{1}{2}$ m. long by 2 broad, presents good facilities for building wharfs, docks, etc., is sheltered from all but the s.w. gales, and averages 16 or 17 ft. in depth; but its depth has diminished about 5 ft. in this century; while its sheltered part, called the harbor, also is shoaling year by year, so that large vessels are compelled to anchor farther out and in an unsafe position. There are plans for its improvement, but they are not prosecuted with energy. The trade of M. V. is extensive; the exports consisting of wool, hides, hair, tallow, salt and dried beef, bones, etc.; and the imports, of cotton and woolen fabrics, hardware, also flour, wine, spirits, and other provisions. The chief trade is with Great Britain. M. has steam-communication with the United States, Rio Janeiro, Britain, and Genoa; and has considerable trade with France, Spain, La Plata, and Italy. In 1830 entered 1,076 vessels, of 794,443 tons; and 871, of 713,177 tons, cleared the port. Imports 1880 amounted to about \$16,167,500; exports to about \$10,238,800. Pop. (1862) with the small suburbs Cordon and Aguada 45,765: (1871) 105,296; (1901) with its environs 278,186, one-third foreigners.—For the history of M., see URUGUAY.

MONTEZUMA I.—MONTFERRAT.

MONTEZUMA I., *mōn-té-zô'ma*, Emperor of Mexico—the most able of the Mexican emperors: ascended the throne about 1437; died 1471. Early in his reign he commenced a war with the neighboring monarch of Chalco, which resulted in the annexation of that kingdom to Mexico. Tlatelolco, Cuixhicas, and Tzompahuacan were afterward annexed. Some reverses which his arms now suffered led to a confederacy of the Tlascalans and two other powerful tribes against him; but in the war which followed, M.'s arms were again signally triumphant, and the territories of the conquered tribes increased the domain of the now all-powerful Montezuma.

MONTEZUMA II., Emperor of Mexico—the last before its subjugation by the Spaniards: succeeded to the throne 1502; died 1520, June 30. He had distinguished himself as a warrior during the reign of his predecessor, and after his accession, carried the terror of his arms to the frontiers of Nicaragua and Honduras. He was at the same time a member of the priestly order, and did not demit his functions on his accession. He devoted his chief attention to the improvement of the laws and of the internal administration, and displayed his taste for pomp and luxury by the magnificence of his household arrangements and a profuse embellishment of his capital. This necessitated heavy taxation, which, combined with the strictness of his administration, led to continual revolts among his subjects, especially those who had lately come under his sway. When Cortes landed in Mexico with his small army 1519, M., blinded by an old prophecy, and by the strange appearance of the invaders, acknowledged them as beings of a superior order, and as his masters (see CORTES). The inhabitants of Mexico having risen against Cortes, the latter caused M., who was then his prisoner, to appear in order to pacify them; but being wounded accidentally by a stone flung from among the crowd of his own subjects, he so keenly felt the indignities which he had suffered, that he repeatedly tore the dressing from his wound, and soon afterward died. Some of his children adopted the Christian religion, and his eldest son received from Charles V. the title Count of Montezuma. One of his descendants was viceroy of Mexico 1697–1701. His last descendant, Don Marsilio de Teruel, Count of Montezuma, was banished from Spain by Ferdinand VII., and afterward from Mexico, on account of his liberal opinions, and died at New Orleans 1836.

MONTFERRAT, *mōnt-fär-rât'*: formerly an independent duchy of Italy, between Piedmont, Milan, and Genoa, now forming part of the kingdom of Italy. It consisted of two separate portions, Casale and Acqui, between the Maritime Alps and the Po; more than 1,300 sq. m.; cap. Casale. M., after the downfall of the Frankish empire, was ruled by its own margraves till the beginning of the 14th c. This illustrious house for a long time disputed the sovereignty of Piedmont with the House of

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Savoy, and sent to the crusades more heroes than any other sovereign house in Europe. Members of the family ruled simultaneously in M., Thessaly, and Jerusalem. On the death of the Marquis John I., 1305, his sister, Iolande or Irene, Empress of Constantinople, succeeded to M.; and her second son became the founder of the family of Montferrat-Palæologus, which became extinct 1533, and M. passed to the Gonzagas of Mantua. In 1631, the dukes of Savoy obtained possession of a portion of M., and 1703, with the consent of the German emperor, the remaining portion passed under their sway, and was incorporated with their own dominions.

MONTFORT, *mōnt'fort*, F. *mōng-for'*: noble French house, descended, according to the most probable opinion, from Baldwin, Count of Flanders, and Judith, daughter of Charles the Bald. AMAURI 2d, Seigneur de M. (a little town between Paris and Chartres), is the first of the family mentioned in history. He lived in the first half of the 11th c. His son, SIMON 1st, had for his third wife Agnes, daughter of Richard, Comte d'Evreux. He left four sons, of whom only AMAURI 4th had issue. The grandson of this Amauri, SIMON 3d, surnamed the *Bald*, Comte de M. and Evreux, married Amicie, daughter of Robert de Beaumont, Earl of Leicester. His second son was the famous SIMON 4th, Comte de M. and Earl of Leicester, subsequently Comte de Toulouse (abt. 1150–1218, June 25), conspicuous in the terrible crusade against the Albigenses (q.v.). In 1198, he went to Palestine at the head of a troop of French knights, but failed in doing anything against the Saracens, and was compelled to return. In 1202, he joined the 4th crusade, which, however, had no religious design at all (see CRUSADES), in consequence of which M. abandoned it. In 1209, he took part in the war of extermination against the Albigenses. He signalized himself by relentless ferocity and his brilliant successes, but was killed by a stone at the siege of Toulouse. He was father of Simon de M., Earl of Leicester.

MONTFORT, SIMON DE; Earl of Leicester: about 1200–1265, Aug. 4; b. France; fourth son of Simon 4th, who was Comte de M. and Earl of Leicester. The title Earl of Leicester came to M. by his grandmother, Amicie de Beaumont, sister and heiress of Robert, Earl of Leicester; but he did not directly or immediately inherit it, for, during the reign of King John, it was borne by Ranulf, Earl of Chester. Some time after the death of Ranulf, M. came to England, and offered his services to Henry III. Already he had great reputation as a warrior, and Henry was so highly pleased with the young French noble, that he conferred on him the title Earl of Leicester. Little did Henry think that the stranger was to prove against himself a great founder and champion of English constitutional liberty. He married Elinor, sister of King Henry III., youthful widow of that Earl of Pembroke to whom, more than to any

other, the people of England owe Magna Charta. After this marriage—which was viewed with disfavor by the king—De M. became a steadfast advocate of the English Charter and of the liberties of the people as against oppression by the crown and undue exaction by the Roman see. After visiting the East, he was sent by the king to undertake the command of Gascony. In 1257, the king's debts were so great, and the rapacity of his foreign relations so unbearable, that the people were in a state of insurrection. The barons assembled, and, under the direction of De M., held the celebrated parliament at Oxford. They passed statutes to enforce the provisions of Magna Charta. The king swore to observe them, but sent forthwith to the pope, praying to be absolved from his oath. The bull of absolution arrived. Henry set his barons at defiance, shut himself up in the Tower, and appealed to Louis of France. England was now in arms. The whole middle class looked up to De M. as their champion and leader, and the war began with the battle of Northampton. The wars of the barons, under De M., have been superficially viewed as the strife of turbulent nobles, who, in the absence of foreign warfare, employed themselves in a contest at home. Later researches, however, have shown that, but for the struggles of De M. and the barons, the concessions at Runnymede would have been a mere worthless parchment. At Lewes, the royal forces were signally discomfited, and the king taken captive. A French chronicler, who praises De M. as 'noble, chivalrous, and the ablest man of the age,' expressly adds that he was 'backed by the general favor of the people,' who at this time were 'unspeakably trampled under foot, and deprived of all their liberties.' The conditions exacted from the king were, that he should observe Magna Charta and the Charter of the Forests; be moderate in his expenses and grants, until his old debts were paid off, and until he was enabled to live on his own property, without oppression of merchants or the poor; and that Englishmen only should be chosen counselors. No new pretensions were introduced, even at this moment of triumph, and the constitutional maxim of respecting the person of the king was carefully upheld. The queen (Elinor of Provence), who was in France, now occupied herself in collecting a large army. To deliberate on the measures to be adopted at this great crisis, writs were issued to the sheriffs, 1265, by De M., directing them to return two knights for each county, and two citizens or burgesses for every city and borough; and from this time may be clearly dated the recognition of the commons as an estate of the realm in parliament. Guardians had been appointed by the barons to watch over the execution of Magna Charta, but 50 years of encroachment on the part of the crown convinced De M. that a stronger and more enduring security would be to commit the care of constitutional freedom thenceforth to the people themselves, whose interests the

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barons thus identified with their own. Mr. Blaauw, who, in his *Barons' War*, presents De M. almost for the first time in his true character, against the mistaken statements accepted by Hume and others, adds, that 'it should be an honest pride to us in after-times that English liberty thus owes its birth to the noblest parentage, confidence in the people': probably it would be more accurate to speak, in connection with De M., not of the 'birth' of English liberty, but of its furtherance at an important crisis. A second war broke out, and this time the popular cause was weakened by defection and treachery. Prince Edward (afterward Edward I.) encountered the barons at Evesham, with a greatly superior army. When defeat was inevitable, the great leader refused to flee. He 'fought stoutly like a giant for the liberties of England,' but fell, overwhelmed by numbers. The death of De M. filled the whole land with mourning. Like Cromwell, whose career in many respects resembles his own, he was denied a grave by the royalists, his head being sent to Wigmore Castle, and his mutilated limbs to different towns; but the people bewailed their dead champion, and the clergy pointed to his glorified spirit in heaven: the people even revered him as a saint and martyr, and invoked his intercession. The influence of De M. was such after his death that it was not deemed prudent to put to death any of the barons who had borne arms against his sovereign; and though the Oxford statutes were formally rescinded, their spirit remained. See *Life*, by M. Creighton (1876), and *Simon de Montfort*, by Pauli, translated by Una M. Goodwin (1876).

MONTGOLFIER, *mōnt-gōl'fī-ēr*, F. *mōng-gol-fe-ā'*, JACQUES ÉTIENNE; and JOSEPH MICHAEL: two brothers, distinguished as inventors of the first kind of Balloons (q.v.): Étienne d. Servièrès 1799: Joseph, the elder brother, d. Paris 1810. They were sons of a noted paper-manufacturer at Annonay, dept. of Ardèche, and early engaged in the same industry. Etienne, after a few successful experiments with the balloon, repaired to Paris; but though his discovery created a great sensation, and was followed out in practice by many eminent men, he obtained little pecuniary aid in carrying on his experiments, and at length retired to his native town, and there resumed the manufacture of paper.—The elder brother, Joseph, had much genius and little education; but the two brothers were fitted to supplement each other's deficiencies, and together they made many discoveries, and both were received as members of the French Acad. Joseph invented the hydraulic screw, the calorimeter, etc., and in the latter part of his life filled a post in the dept. of arts and manufactures.

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MONTGOMERY, *mont-gŭm'ér-ĭ*: city, cap. of Montgomery co. and of the state of Alabama, on the Alabama river, 180 m. n.e. of Mobile by railroad, 330 m. by steamer. Four railroads, the Louisville and Nashville, Western, Georgia Central, and M. and Florida, furnish connection with all inland points, while steamers connect with Mobile lines for various domestic and foreign ports. It is in a rich cotton-growing region, and its annual receipts of this staple range from 120,000 to 140,000 bales. In recent years there has been a great increase of manufacturing, with a rapid development of commercial interests and growth in population. The city has 12 churches, good schools, which are free and are open nine months each year, several private schools, three daily newspapers, two national and five private banks, a widows' and an orphans' home, and an infirmary for the sick and poor. M. is beautifully located and is one of the most healthful cities in the south. Water is supplied by the Alabama river, also by an artesian system which furnishes 5,000,000 gallons per day and the works for which cost \$300,000. The state-house on Capitol Hill, a fine structure, was rebuilt 1851. Among notable buildings are the city hall, court-house, and masonic temple. The city is lighted by gas and electricity, and has 15 m. of electric street railroad, the plant for which cost \$175,000. Nearly one-fourth of the population is engaged in manufacturing pursuits. There are a cotton-mill; two cotton-seed-oil mills, one of which is among the largest in the country, having a crushing capacity of 150 tons per day and in which \$250,000 capital has been invested; two ice factories, a large flour-mill, six carriage and wagon shops, four foundries, four wood-working factories, a vinegar factory, a paper-box shop, and a brewery. Among the other manufactures are alcohol, candy, crackers, brooms, soap, and fertilizers. Six brick-yards supply building material, for which there is active demand. Large deposits of coal and iron are within 60 m. of the city, and a narrow-gauge railroad runs 50 m. to immense forests of valuable pine. M. was settled 1817, received its name from Gen. Richard Montgomery, became state cap. 1847, and was cap. of the Confederacy 1861, Feb.—1862, May. Pop. (1870) 10,588; (1880) 16,713; (1890) 21,883; (1900) 30,346.

MONTGOMERY, *mont-gŭm'ér-ĭ*, GABRIEL, Comte DE: French knight of Scottish extraction, officer in the Scottish Life-Guard of the king of France: abt. 1530–1574, May 27. At a tournament given 1559, June 30, by Henry II. in honor of his daughter's marriage with Philip of Spain, the king insisted upon young M. entering the lists with him. M. reluctantly complied, and the shaft of his broken lance entering the king's visor at the eye, Henry II. was borne insensible from the ground, and so continued 11 days, when he died. M., though blameless, left France, and soon afterward embraced Protestantism in England. On the commencement of the religious wars 1562, he returned to his native country to support

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the Prot. cause, was one of the Prot. leaders, defended Rouen with great bravery, and gained advantages over the royalists. During the massacre of St. Bartholomew, he happened to be in Paris, and owed his escape to the swiftness of his horse, and fled to England. In 1574, at the head of a band of Huguenots, he landed in Normandy, and commenced war; but being compelled at last to surrender the castle of Domfront, he was carried to Paris; and though the general to whom he surrendered had assured him of his life, he was beheaded, after long imprisonment.

MONTGOM'ERY, JAMES: minor British poet: 1771, Nov. 4—1854, Apr. 30; b. Irvine, Ayrshire, Scotland; son of a Moravian preacher. At the age of seven years he was sent to the Moravian settlement at Fulneck, near Leeds, to complete his education for the Moravian pastorate. At Fulneck, the course of study seems to have been too severe in its character for the young poet; the imaginative side of his mind was allowed no recognition, and it was only by stealth that he read Cowper's poems and *Robinson Crusoe*. Much of his leisure at school was employed in the composition of verses and of music. In 1789, he ran away, and, after four years of various employment, became engaged as clerk to the editor of *The Sheffield Register*, for which he soon began to write political articles. In 1794, he commenced a newspaper of his own, *The Sheffield Iris*, which he continued to edit till 1825, when he retired. During his editorship, M. was twice subjected to fine and imprisonment: 1795 he was fined £20, and sentenced to three months' imprisonment, for printing some copies of a miserable ballad in which govt. suspected that sedition lurked; and 1796 he was fined £30, and imprisoned six months, for giving an account of a Sheffield riot. He received a govt. pension of £150 in 1835, and he died at his own house in Sheffield. His principal works are: *The Wanderer of Switzerland* (1806); *The West Indies* (1809); *The World before the Flood* (1812); and *The Pelican Island, and Other Poems* (1827). A collected ed. of his minor poems appeared 1851; and 1853 his *Original Hymns for Public, Private, and Social Devotion* closed the series. See his *Memoirs*, of value as materials for the provincial political history of his times (7 vols. 1856-58).

His poems are melodious, full of picturesque description and the gentlest human feeling. The personages introduced in his poems are, however, only shadows, or touched with the faintest color of character. But he holds a well-defined position among the favorite poets of his country by several of his hymns and minor poems, and by his exquisite verses on Home, which commence the third part of *The West Indies*. His poetic repute has suffered somewhat by his being confused with Robert Montgomery (q.v.).

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MONTGOMERY, JOHN BERRIEN: 1794, Nov. 17—1873, Mar. 25; b. Allentown, N. J.; entered the U. S. navy 1812, and as midshipman took part in the attack on Kingston, Canada, and the capture of Little York, Fort George, and Newark. In 1813, Sep. 10, he was with Perry when he captured the British fleet on Lake Erie, and received the thanks of congress and a sword for his gallant services. 1814, Aug., he assisted in the attack on Mackinaw. In 1815 he fought with Decatur against the Algerine pirates; and 1818, Feb., was promoted lieut. Made commander 1839, he took part in the Mexican war, in the blockade of Mazatlan, and in the capture of Guaymas on the Gulf of California. He was executive officer of the navy-yard at Washington 1849–51; 1853 was commissioned capt.; 1857 commanded the *Roanoke* and brought Walker's 250 filibusters to New York; 1859–62 commanded the Pacific squadron; 1862 was retired as commodore; and 1866 was made rear-admiral. He died at Carlisle, Pa.

MONTGOMERY, RICHARD: 1736, Dec. 2—1775, Dec. 31; b. near Feltrim, Ireland. Educated at Trinity College, Dublin, he entered the English army as ensign at the age of 18. In 1757 his command was ordered to Halifax, N. S., and soon afterward he took part in the siege of Louisburg, where he was made lieut.; was with Amherst in his expedition against the French on Lake Champlain in 1759; next year he became adjt.; served in the campaign against Montreal, and was made capt. 1762. Then he was ordered to the W. Indies; but, 1763, returned to New York, soon afterward going to England, where he formed the friendship of many influential liberal members of parliament. In 1772 he sold his commission, and next year came to America, bought a farm near New York, and married the daughter of Judge R. R. Livingston. He was chosen a delegate to the first provincial congress, New York, 1775, May; and in June was made a brig.gen. in the continental army, being the only officer of that rank not from New England. Owing to Gen. Schuyler's illness, M. was put in command of the expedition to Canada, and in the face of great difficulties and discouragements in a short time took the forts of St. Johns and Chambly, and, 1775, captured Montreal. His army by this time numbered only about 300 men, to which Arnold's command of 600 men was added, with which meagre force he besieged Quebec 1775, Dec.; having been promoted to maj.gen. for his services. The cold weather, the breaking out of small-pox in the army, and the fact that the term of service of most of his men was about to expire, constrained him to urge an immediate assault on the city. He himself led the attack on the s. part of the lower town, in a heavy snow-storm Dec. 31. The first barrier was gallantly overcome, and M. was leading his men on with cheering words, when a British discharge of artillery killed him and his two aids, and threw his command into confusion, so that the British succeeded in driving the Americans back and

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capturing about 400 of their men. The British joined the Americans in paying tribute to his bravery, the gov. and city officials burying him with military honors, while congress passed resolutions of 'grateful remembrance, respect, and high veneration,' and erected a monument to his memory in front of St. Paul's Church, New York. In parliament Burke lauded his virtues. On the rocks over Cape Diamond, where he led his men and was killed, have been inscribed the words: 'Here Major-General Montgomery fell, December 31, 1775.' In 1818, by a special 'act of honor' of the N. Y. legislature, the gov. of Canada was requested to permit the remains of M. to be removed to New York. This being granted, they were buried in St. Paul's Chapel, near the monument erected by congress to his memory. His widow survived him 52 years, dying 1828.

MONTGOMERY, ROBERT: clergyman and versemaker, who gained notoriety, if not fame: 1807-1855, Dec. 3; b. Bath, England. He graduated B.A. at Oxford 1833, M.A. 1838, and was ordained 1835. In 1836, he became minister of Percy Street Episcopal Chapel, London: he afterward removed to Glasgow, where he preached four years, but returned to London, and resumed office at Percy Street Chapel 1843. M.'s works comprise a large number of volumes in prose and verse, on themes more or less sacred. He is best known by his so-called poems; and these are made notable by Macaulay's scathing ridicule of them, which, however, did not check their sale. Macaulay, in his essay, points out M.'s feebleness and absurdity in thought and expression. *The Omnipresence of the Deity* (1828) reached its 28th ed. 1858. But M.'s works have now become part of the lumber of libraries.

MONTGOMERY, WILLIAM READING: 1801, July 10-1871, May 31; b. Monmouth co., N. J. He was educated at West Point, graduating 1825, when he became lieut., and was on garrison duty till 1838. Then he was made capt., serving on the Canadian border 1838-40, in the Florida war 1840-42, and taking part in the occupation of Texas 1845. During the Mexican war he was twice wounded—at Resaca de la Palma, when he was made brevet major, and at Molino del Rey, after having been made commander of his regt. As such he led it at Chapultepec and Mexico. He was then brevetted lieut.col., and commissioned maj. 1852. In 1855 he was removed from the army because of his sympathy with the free-state men in Kan., where he then was stationed. When the civil war began, he at once raised the 1st regt. N. J. volunteers, and was with the army in its defeat at Bull Run. In 1861, May, he was made brig.gen. of vols. and military gov. of Alexandria, Va., as afterward he was of Annapolis, Md. Then he was stationed at Philadelphia till 1863, and at Memphis, Tenn. Owing to failing health he resigned 1864, Apr. 4, and entered business in Philadelphia. He died in Bristol, Penn.

MONTGOMERYSHIRE—MONTH.

MONTGOMERYSHIRE: inland county of n. Wales, between Shropshire on the e. and the Welsh counties, Merioneth and Cardigan, on the w.; greatest length s.e. to n.w. about 40 m., breadth about 35 m.; 495,089 acres or about 773 sq. m., of which about 80,000 acres are under tillage. The surface is almost wholly mountainous, largely bleak elevated moorlands; but toward the English border are several warm, fertile, and well-wooded valleys. Offa's Dyke traverses the s.e. corner. The Severn, the Vyrnwy, and the Dovey are the principal rivers. The county belongs almost entirely to the basin of the Severn. The mineral wealth of M. is not great, but copper, lead, and zinc are procured, and millstones, slates, and limestone are quarried. On the uplands, the soil is poor, and suited principally for mountain pasture; but in the valleys grain and flax are raised. Cattle and sheep and the pure breed of Welsh ponies called 'Merlins' are reared. The Welsh-flannel manufacture is extensive in the county. The cap. is Montgomery (pop. 1,500), from which the county received its name, and which was so called from Roger de Montgomery, Earl of Arundel and Shrewsbury, who, 1093, recaptured the town and castle, which had been wrested during the previous year by the Welsh from the founder, Baldwin, lieut. of the Marches to William the Conqueror and William Rufus. The county sends one member to the house of commons. The county business is carried on at Welshpool and Newtown alternately. There is excellent trade in cattle and horses.—Pop. (1871) 67,623; (1881) 65,798; (1891) 58,003; (1901) 54,892.

MONTH, n. *mǣnth* [AS. *monath*, a month—from *mona*, the moon: L. *mensis*; Gr. *mēn*; Ger. *monat*, the period of the moon's revolution: Goth. *mena*; Icel. *mana*; Ger. *mond*; Gr. *mēnē*, the moon]: the twelfth part of the year; in popular usage, four weeks. **MONTH'LY**, a. -*lī*, happening once a month, or every month; lasting a month; performed in a month: AD. in every month: N. a monthly publication. **CALENDAR MONTH**, one of the twelve divisions of the year, from 28 to 31 days in each. **LUNAR MONTH**, one revolution of the moon, occupying from one new moon to another, about 29 days, 12 h., 44 min. **MONTH'S MIND** (in the old English sense of *month's remembrance*), in the Rom. Cath. Church, a memorial office for the dead, either continued through a month after decease, or repeated at the end of a month. **THIS DAY SIX OR THREE MONTHS**, in *Parliament*, a common motion, when the rejection of a bill is desired, that its next stage shall be taken at a time when the house will not be sitting—should the motion be carried, such a bill cannot be reintroduced in the same session.

MONTH—MONTHOLON.

MONTH: originally the period of the moon's revolution round the earth. If this is reckoned from the position of the moon among the stars to her return to the same position, the period is called a *sidereal* month, and consists of 27 days, 7 hours, 43 minutes, $11\frac{1}{2}$ seconds; but if from new moon to new moon, it is longer, being 29 days, 12 hours, 44 minutes, 3 seconds; this is called a *synodic* month (see **MOON**). The latter period forms one of the three natural measures of the lapse of time, and, notwithstanding that its efficiency depends on the state of the atmosphere, it ranks next to the day in importance. There are several other periods used by astronomers to which this name is applied, as the *tropical* or *periodic* month (27 days, 7 hours, 43 minutes, 4·7 seconds), reckoned from the moon's passing the equinox till her return to the same point; the *nodal* month (27 days, 5 hours, 5 minutes, 29 seconds), from ascending node to ascending node; the *anomalistic* month (27 days, 13 hours, 18 minutes, 37 seconds), from perigee to perigee; and the *solar* month, the twelfth part of a solar year, consisting of 30 days, 10 hours, 29 minutes, and 4 seconds. Distinct from all these is the *civil* or *calendar* month, fixed by law for ordinary purposes, and consisting of a fixed number of days—from 28 to 31—according to the particular month. The calendar months are as follows:

	Days.		Days
1. January,	31	7. July,	31
2. February,	28	8. August,	31
“ (leap years),	29	9. September,	30
3. March,	31	10. October,	31
4. April,	30	11. November,	30
5. May,	31	12. December,	31
6. June,	30		

See also the separate months under their own titles. The names by which the months are designated throughout Christendom were given them by the Romans, though Charlemagne in the 9th c., and the French directory in the end of the 18th c., attempted to substitute descriptive epithets.

MONTHOLON, *mōng-to-lōng'*, CHARLES TRISTAN DE, Comte, afterward Marquis DE: 1782–1853, Aug. 21; b. Paris; descended from an ancient French family. At the age of 10 he entered the navy, but exchanged it for the army in 1798. His rise was rapid. He displayed great zeal on behalf of the first consul in the revolution of 18th Brumaire, in the capacity of *chef d'escadron*. He served in a number of campaigns, and was severely wounded at Wagram. Napoleon made him his chamberlain in 1809. He was made a general of brigade in 1814, and appointed to the chief command in the department of Loire. On Napoleon's abdication, M. remained in France, but held aloof from the Bourbons. No sooner had the emperor escaped from Elba and landed at Fréjus, than M. hastened to join him. He was present at Waterloo, and accompanied Napoleon to St. Helena, continuing his devoted attentions to him till he breathed his last, and being named

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in his will as one of his trustees, spared no exertion to carry its provisions into effect. Along with Gen. Gourgaud, he published *Mémoires pour servir à l'Histoire de France sous Napoléon, écrits à Ste.-Hélène sous sa dictée* (8 vols. Par. 1823). He afterward published a work entitled *Récit de la Captivité de Ste.-Hélène* (London. 1847). In the proclamation which Louis Napoleon issued on his landing at Boulogne in 1840, M. was named chief of his staff, and on this account he was condemned by the chamber of peers to 20 years' imprisonment; but he was afterward pardoned.

MONTH'S MIND: see OBIT.

MONTI, *mon'te*, VINCENZO: regenerator of modern Italian poetry: 1753, Feb. 19—1828, Oct. 13; b. in the Roman province of Ferrara. He studied in the Univ. of Ferrara. On the termination of his studies, he went to reside in Rome (1778), where M., whose fault through life was a hasty susceptibility, became involved in a bitter squabble with Alfieri, whose fame as the master-tragedian of Italy was then in the ascendant—a fact which may have been unpalatable to M., in consequence of the failure of his own dramatic attempts. The assassination of Basville, the republican envoy of France, afforded to M. a subject for his poem, *La Basvilliana*. His two succeeding poems, the *Musogonia* and the *Feroniade*, contained bitter invectives against France and Bonaparte; but on the appearance of a French army before Rome, M., with the inexcusable inconsistency which characterized his political conduct throughout, hastened to espouse the cause of France, and to invoke the protection of Bonaparte. M. was shortly afterward appointed sec. of the Cisalpine Directory; and 1789 went to France, where he undertook the translation of Voltaire's poetical works. Returning to Italy, he was appointed prof. in the Univ. of Pavia. On the fall of the empire, M. became the eulogist of the Austrian possessors of his country. Through all these political vicissitudes, he pursued with vigor his studies of the classics, and accomplished one of his greatest works, the translation of the *Iliad* into Italian verse. M. died at Milan. The best editions of his works are those of Milan (1825-27, 8 vols.), and *Opere Inedite e Rare* (Milan 1832-3, 5 vols.). M. had warm admiration of Dante, and partook, in some degree, of the quality of the great master. His best works are distinguished by sustained grandeur of imagery and diction, by daring flights of imagination, and by the delicacy, elevation, and fire of the sentiments.

MONTICELLO, *mōn-tē-sĕllō*: for 60 years the home of Pres. Thomas Jefferson; 3 m. w. of Charlottesville, Albermarle co., Va. The mansion, completed about 1774, was one of the most beautiful in the South, and the grounds were laid out in the most attractive manner. The grave of Jefferson, in a family cemetery close by, is marked by an obelisk of granite. Soon after the death of its founder the estate passed out of the possession of his family, and the mansion has fallen into decay.

MONTICLE—MONTMORENCY.

MONTICLE, n. *mǝn'ti-kl*, or **MON'TICULE**, n. *-kāl* [*a* dim.—from *L. mons* or *montem*, a mountain or great hill]: a little mount; a hillock. **MONTICULATE**, a. *mǝn-tik'ū-lāt*, having many small projections. **MONTON**, n. *mǝn'tǝn*, among *miners*, a heap of ore; a mass under the process of amalgamation.

MONTILLA, *mǝn-tēl'yâ*: town of Spain, in the modern province of Cordova, 20 m.'s.s.e. of the city of Cordova; on a hillside rising from the s. bank of a tributary of the Xenil. Manufactures of coarse linen and earthenware are carried on, and oil-mills are in operation. A famous pale, dry, light wine is grown in the vicinity; and from the name *M.* is named the sherry known as *Amontillado*. *M.* was the birthplace of Gonzalo de Cordova, the 'Great Captain.' Pop. about 14,000.

MONTJOIE ST. DENIS, *mǝng-zhwâ' sāng deh-nē'*: war-cry of the ancient kings of France, said to be as ancient as the days of Clovis, and from which the king-of-arms, Montjoie, who had exclusive jurisdiction in French heraldry, derived his title.

MONTLUCON, *mǝng-lü-sōng'*: town of central France, dept. of Allier, picturesquely situated on a hill on the right bank of the Cher, 40 m. w.s.w. of Moulins. It has extensive manufactures of iron, steel, and plate-glass, besides lime-kilns, saw-mills, and woolen-mills. Its railway connections are abundant, and it has trade in corn, wine, and fruits. *M.*, as a great industrial centre, has sometimes been called the French Manchester. At a distance of 10 m. are the wells of Nériss-les-Bains, famous in the time of the Romans—of whom many traces are left—and still frequented by invalids.—Pop. (1881) 24,767; (1886) 26,250; (1896) 31,595.

MONTMARTRE: see **PARIS**.

MONTMORENCY, *mǝng-mo-rǝng-sē*, **ANNE**, first Duc DE, Marshal and Constable of France: b. 1493, Mar.—1567, Nov. 12; b. Chantilly; of one of the oldest and greatest of the noble families of France, named from Montmorency, place about 9 m. n.n.w. of Paris. He received, it is said, the name of *Anne* from his godmother, Anne of Brittany. He distinguished himself by gallantry and military skill in the wars between Francis I. and Emperor Charles V., and was taken prisoner with his sovereign in the battle of Pavia, fought against his advice. He afterward became the leader of the French govt. showing great ability in finance and diplomacy, and was made constable 1538; but his rough manners made him an object of dislike to many; and the suspicions of the king having been aroused against him, he was suddenly banished from court 1541, and passed ten years on his estates, till the accession of Henry II., when he came again to the head of affairs. In 1557, he commanded the French army which suffered the terrible defeat of St. Quentin, in which he was taken prisoner. During the minority of Charles IX., *M.*, with the Duke of Guise and the Marshal St. André, composed the

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famous triumvirate which resisted Catharine de' Medici. In 1562 and 67, he commanded the royal army against the Huguenots, and in both wars gained victories, but received a fatal wound at St. Denis, and died at Paris on the following day.

MONTMORENCY', HENRI II., second Duc DE: 1595, Apr. 30—1632, Oct. 30; b. Chantilly; grandson of the famous Constable de M. His godfather was the great *Henri Quatre*, who always called him his 'son.' When he was 17 years of age, Louis XIII. made him admiral, and he defeated the Huguenots in Languedoc, and took the Isle of Ré from those of Rochelle. He afterward gained other victories over them, and 1630 received the chief command of the French troops in Piedmont, where he defeated the Spaniards, for which he received a marshal's baton. Unhappily for himself he ventured to oppose Richelieu, who had always been his enemy, and espousing the cause of Gaston, Duke of Orleans, led the rebel army; for this he was declared guilty of high treason, and Marshal Schomberg being sent against him, defeated him at Castelnaudary, and took him prisoner. M., though almost mortally wounded, was carried to Toulouse, sentenced to death by the parliament, and notwithstanding his expressions of penitence, and the most powerful intercessions made for him—e. g., by King Charles I. of England, the pope, the Venetian Republic, and the Duke of Savoy—was beheaded. M. was distinguished for amiability and courtesy of manners, as well as for valor.

MONTMORENCY' (or MONTMORENCI), FALLS OF: on the M. river in Canada, near its mouth, about 8 m. from Quebec, near the little village of M. The river, 50 ft. wide, falls 250 ft.

MONTORO, *mōn-tō'rō*: a town of s. Italy, province of Avellino, partly on the slope and partly around the base of a hill, 12 m. n. of Salerno. It forms the central point of several villages, and has large markets and some linen and cloth manufactures.—Pop. 4,721.

MONTO'RO: pleasant town of Spain, in the modern province of Cordova, on a rocky ridge around which winds the Guadalquivir, here crossed by a fine bridge dating from the 16th c.; 26 m. e.n.e of Cordova. It contains one of the best hospitals in Andalusia. Scarcely any drinkable water can be obtained within the town. The heights in the vicinity are clothed with olive plantations, and oil is largely exported from this quarter. Woolens and earthenware are manufactured. Pop. (1877) 13,293.

MONTPELIER, *mōnt-pēl'yér*, or *mōnt-pē'lī-ér*: town, cap. Washington co., and of the state of Vt.; in the central part of the state, on the Winooski river, 40 m. from Burlington, about 200 m. n.w. of Boston. It is in a beautiful valley on the Central Vermont, and the M. and Wells River railroads, and has considerable trade with adja-

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cent agricultural and dairy regions. It has six churches, good schools, is the seat of the Vt. Methodist Sem. and Female College, has the state library, a public reading-room, and two religious and three weekly secular papers and daily newspapers are issued during the legislative sessions. There are two banks, two fire insurance companies, one life insurance company, and four hotels. The state house, of granite in the Grecian-Doric architecture with dome 124 ft. high, is an admirable structure. The city is a summer resort. Pop. (1870) 3,023; (1880) 3,219; (1890) 4,160; (1900) 6,266.

MONTPELLIER, *mōng-pā-lyā'* (Lat. *Mons pessulanus* or *puellarum*); city of France, dept. of Hérault; 43° 36' n. lat., and 3° 50' e. long; about 480 m. s. of Paris, 7 m. from the Mediterranean. Seen from a distance, M. has an imposing appearance, from the number of its towers, steeples, and cupolas; but though its suburbs and the newer parts of the city are clean and well built, the interior of the old town disappoints expectation, being remarkable chiefly for its crooked, dark, narrow, and dirty streets, though it has many good houses. The public walks, especially the Place de Peyrou, one of the finest squares in France (575 ft. long, 410 ft. wide), and some other elevated points, afford superb views, embracing the Mediterranean, the Alps, the Cevennes, and the Pyrenees. The most noteworthy buildings are the cathedral, the theatre, the exchange, the Hall of Justice, the prefecture, the observatory, and the university. The university, founded 1196, is composed of three faculties—medicine, founded 12th c. by Arabian physicians, and still ranking among the best in Europe—exact sciences—and physical sciences. M. has a botanical garden, the oldest in Europe; a public library of 50,000 vols., and a pharmaceutical school; admirable museums, natural history and fine art collections, etc. The industrial products of M. are pigments and other chemical preparations, brandy, liqueurs, perfumes, soap, corks, sugar, cotton, woolen, and fine leather goods; and the trade, which is very important, includes, besides these articles, wine, seeds, olive oil, and fruits. Railways to Marseille, Cette, and other ports, besides various canals, facilitate commercial and social intercourse, and few cities of the empire hold out greater attractions in regard to intellectual culture. Its geographical position has led to its being selected as a place of residence for consumptive patients; but the extreme clearness, and even sharpness of the air in the more elevated parts of the town, the occurrence of the icy wind known as the *Mistral*, and the sudden accession of overpowering heats, seem materially to counteract some of its long reputed advantages.—Pop. (1886) 53,506; (1891) 69,258; (1901) 75,950.

MONTRE, n. *mōngtr* [F.]: mounted diapason: an organ stop whose pipes form part of the case or are placed away from the sound-board—one of the foundation stops is generally used for this purpose.

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MONTREAL, *mönt-rē-awl'* [F. *mōng-trā-âl*] : largest city of the Dominion of Canada, in the province of Quebec; lat. 45° 31' n.; long. 73° 35' w.; on the e. side of the island of Montreal (q.v.), at the confluence of the Ottawa with the St. Lawrence; at the head of ocean navigation, 160 m. above Quebec, 986 m. from the Atlantic; 200 m. below Lake Ontario, 400 m. from New York, 2,750 m. from Liverpool. M. has a noble situation, being built on a succession of terraces on the side of a hill. Its eastern suburb, called Hochelaga, was originally the site of an Indian village of the same name, discovered 1535, Sep., by Jacques Cartier; and it is from his admiring exclamation at the view from the neighboring hill that M. (corrupted from Mont Royal) derives its name. The westernmost permanent settlement which the French obtained in Canada, it was under them merely an outpost of Quebec, and continued to be such under British rule till 1832, when it became a separate port. Since then, the rapidity of its progress has been astonishing. By the deepening of the shallower parts of the river above Quebec, M. is now accessible to vessels of over 3,000 tons' burden, and drawing 19 to 22 ft. Its harbor, lined with wharves for a mile and a quarter, at which 125 ships can lie at one time, is, from its inland position (90 m. above the influence of the tides), perfectly safe. Situated at the head of the ocean navigation of the St. Lawrence, M. has naturally become the depot for the exports and imports of all the Canadas. At the same time, the obstruction to vessels sailing further up the river, caused by the rapids, has been surmounted by magnificent canals. The Lachine Canal avoids the Lachine Rapids (see CHINE, LA: ST. LOUIS, LAKE), and simplifies direct communication with Lake Ontario, which is accessible from Ottawa by the Rideau river and canal. The Welland Canal, passing around Niagara Falls, connects Lakes Ontario and Erie; so that M. is at the foot of an improved chain of inland waters extending to Lake Superior. The canals connecting M. with Lake Ontario have locks of 200 ft. by 45, with 9 ft. of water on the sills; the locks of the Welland Canal are rather smaller. By means of the Ottawa, M. is in contact with the vast lumber-country adjoining that river and its tributaries. While navigation is open, an extensive daily traffic is carried on, by steamers and sailing-vessels of every description, with Lake Ontario and the Ottawa district, as well as with the lower St. Lawrence; and the ships of the Montreal Ocean Steamship Company, by aid of a subsidy from the Canadian govt., keep up weekly communication with Liverpool, and the harbor is constantly crowded with vessels from other foreign ports. After the navigation of the St. Lawrence is closed, the ocean steamers find a harbor at Portland, Me., connected with M. by a railway of 292 m. This line belongs to the Grand Trunk railway company, and crosses the St. Lawrence at M. by the celebrated tubular Victoria Bridge, the length of which, including its two abutments and

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24 piers, is more than a mile and three-quarters. By the lines of the same company, M. has railway communication with upper Canada, the western states, and lower Canada, while the Intercolonial railway gives communication with Halifax and St. John. Several other lines afford direct communication with all the important cities and towns in New England and N. Y. The position, therefore, of M., as a centre of commerce, is scarcely surpassed, and its rapid advance in consequence has placed it, within the last few years, among leading commercial cities of the American continent. The development of Manitoba and the Canadian northwest, and the progress of the Canada Pacific railway, tend to increase its commercial importance. In 1902 the imports were valued at \$60,949,352; the exports at \$55,442,159; the customs dues totalled \$10,041,662. The harbor is open on an average about eight months, from the latter half of Apr. to the beginning of Dec. The manufactures of M. are considerable, the principal being boots and shoes, tobacco, cotton, locomotives, passenger and freight cars, saws and axes, steam-engines, type, India-rubber shoes, paper, furniture, woolens, cordage, and flour.

The public buildings of M. are numerous and handsome. Among them are Bonsecours Market, Courthouse, City Hall, and Bank of M. It is, however, for the size and magnificence of its churches that M. is most remarkable. The huge Rom. Cath. Cathedral of St. Peter is after the plan of St. Peter's at Rome; it is 300 ft. long by 225 wide at the transepts, and is crowned by five domes, one of them 250 ft. high. Though smaller than this, the Church of Notre Dame, hitherto serving as cathedral, is also a very large building, and it is certainly one of the finest churches on the continent of America. Built in the Gothic style of the 13th c., it can accommodate between 10,000 and 12,000 people. It has six towers, of which the three on the main front are 220 ft. in height; and its chief window is 64 ft. high and 32 broad. There are several other Rom. Cath. churches belonging to the order of St. Sulpice, to whose members chiefly M. owes its foundation, and who still hold the seigniory of the island on which the city is built. Adjoining the cathedral is the Seminary of St. Sulpice, to which a large addition has been built within the last few years at a cost of \$40,000. The city contains some of the largest conventual establishments in the world. The general wealth, indeed, of the Rom. Cath. Church in M. has grown enormous in consequence of the increased value of the property given to it during the early settlements of the French. The Church of England has recently erected, at an expense of more than \$100,000, a new cathedral. St. Andrew's Church (Presb.) is a chaste Gothic structure; and the Methodists have a handsome church in florid Gothic. Besides the Rom. Cath. college and St. Mary's College of the Jesuits, there are theological colleges of the Church of England, the Presb., Meth., and Congl. churches. M. possesses an important

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under the name M'Gill College. Founded by bequest of Hon. Jas. M'Gill 1811, erected into a univ. by royal charter 1821, reorganized by amended charter 1852, it has five faculties, art, applied science, law, medicine, and veterinary science. There are however five applied theological colleges with buildings adjoining the university and the medical schools of the universities of Bishop's College and Victoria, are noted features of the higher educational system of the Dominion. M. is supplied with water by works which cost about \$600,000: the water is brought from the St. Lawrence above the La-chine Rapids, by an aqueduct five m. long, to a pond, from which it is forced up, by power derived from part of its surplus waters, into reservoirs capable of containing 20 millions of gallons, 200 ft. above the river. Along the side of the 'Mountain,' there is a line of mansions, which command the view that astonished Jacques Cartier, and which may compare with the suburban mansions of the wealthiest cities in Europe or America.—M. was the first city on the American continent to burn its garbage and night-soil. Pop. (1779) 7,000; (1840) about 27,000; (1850) 57,000; (1861) 90,323; (1871) 107,225; (1881) 140,863. Of the total pop., 103,600 were Rom. Catholics; and 79,000 were of French, and 30,000 of Irish, origin. Pop. (1890) 216,650; (1901) 267,730.

MONTREAL' ISLAND: large and fertile island on which the city of Montreal is built; 30 m. long, 10 m. greatest breadth; 197 sq. m. Formed by the separation of the two channels by which the Ottawa issues into the St. Lawrence, its surface, except at Mount Royal, is diversified only by gentle undulations.

MONTREUX, mōng-tréh': village on the n. shore of the Lake of Geneva, 14 m. s.e. of Lausanne. Its beautiful situation and mild climate and high repute for healthfulness attract many visitors, and the place abounds with *pensions*. There are several other villages (among them, Clarens) in the commune of M.—Pop. of commune (1881) abt. 8,000.

MONTROSE.

MONTROSE, *mŏn-trŏz'*: royal and parliamentary borough and seaport on the n.e. coast of Scotland, county of Forfar; at the mouth of the river South Esk, about 80 m. n.e. of Edinburgh, 40 m. s. of Aberdeen. It stands on a level peninsula between M. Basin (a tidal loch, 7 m. in circumference, but almost dry at low water) and the mouth of the river South Esk. A fine suspension-bridge, 432 ft. long and 26 ft. broad—erected 1828–9 at a cost of nearly £23,000—connects the town with Rossie Island, which is again connected with the mainland by a small drawbridge. The Royal Lunatic Asylum, opened 1868, accommodates about 400 patients. Between the town and the shore are the 'Links' or downs, among the finest in Scotland for golfing or cricketing. The harbor, one of the best on the e. coast, affords excellent accommodation to vessels of large tonnage, having 18 ft. of water on the bar at low-water of spring-tides. Two light-houses stand in line on the n. bank of the river, about 400 yards apart, while a tower, named the Scurdyness Light-house, erected by the board of trade 1870—exhibiting a clear white light, visible at nearly 20 m. distance—stands at the mouth of the river. Flax-spinning is the chief manufacture: three factories employing more than 2,000 hands, at a weekly cost of about £1,500. A large saw-mill employs nearly 300 men and boys. There are good schools, an academy, and a public library of about 20,000 vols. In 1880 entered and cleared the port 740 vessels, 94,000 tons; value of imports and exports £293,795. Imports—coal, lime, slate, iron, flax, and manures; exports—manufactured goods, salmon, herring, dressed wood, and agricultural produce. Pop. (1871) 14,548; (1891) abt. 15,000.

MONTROSE', JAMES GRAHAM, first Marquis of and fifth Earl of: 1612–1650, May 21; b. at Old Montrose, near Montrose town; of a family that can be traced back as far as 1128.—Its first notable member was Sir JOHN GREME of Dundaff, who fell at the battle of Falkirk, 1298, July 22. Early in the 15th c., Sir William Graham married for his second wife a daughter of King Robert III. ROBERT, eldest son of this marriage, was ancestor of the Grahams of Claverhouse. The third Lord Graham, created Earl of Montrose by James IV., fell at Flodden; his eldest son at Pinkie. The next in succession became viceroy of Scotland after James VI. had ascended the throne of England. His eldest son, John, who succeeded to the earldom 1616, married Lady Margaret Ruthven, eldest daughter of William, first Earl of Gowrie, and sister of the unfortunate nobleman who gives name to the *Gowrie Conspiracy*. The issue of this union was five daughters and one son, James Graham, the 'great Marquis,' subject of this sketch.

M.'s mother died 1618, his father 1626. In the following year the boy was sent to the Univ. of St. Andrews by his guardian and brother-in-law, Archibald, Lord Napier, son of the famous inventor of logarithms. During the two or three sessions of his attendance at college,

M. showed a genuine predilection for literature, which the stormy character of his after-life never quite destroyed. In his 17th year he married Magdalene Carnegie, daughter of Lord Carnegie of Kinnaird, Earl of Southesk. On attaining his majority, he left Scotland, to travel on the continent, visited the academies of France and Italy, and perfected himself in the accomplishments of a gentleman and a soldier. On his return, he was introduced to King Charles I., but, owing, it is said, to the machinations of the Marquis of Hamilton, was coldly received by that monarch, and thereafter, soon as he reached Scotland, joined the ranks of the king's opponents—at that period the majority of Scotchmen. M. came back in the very year (1637) when the tumults broke out in Edinburgh on the attempt to introduce the Prayer-book. Whether his conduct at this moment was the result of chagrin, or whether he was carried away by the prevailing enthusiasm, or by the persuasions of craftier persons than himself, is difficult to say. At any rate, the youthful nobleman soon became to appearance one of the most zealous of the Covenanting lords. He was one of the four noblemen selected to compose the 'Table' of the nobility, which, with the other Tables of the gentry, of the boroughs, and of the ministers, drew up the famous National Covenant (see COVENANTS), sworn to by all ranks at Edinburgh in the spring of 1638. In 1639 he made three military expeditions to Aberdeenshire to overawe the royalists; and he twice took the city of Aberdeen. On the first occasion (Mar. 29), he compelled the inhabitants to subscribe the Covenant, but did no injury to the city. His 'too great' humanity is even lamented by Baillie. On the second (May 25), he imposed on the city a fine of 10,000 merks; but though his soldiers pillaged the place, he honorably resisted the importunities of the zealots among the Presb. clergy, who wished to expose it to the horrors of conflagration. Baillie again complains of his 'too great lenity in sparing the enemy's houses.' The arrival at Aberdeen, by sea, of the Earl of Aboyne—Charles's lieutenant of the north—with some reinforcements, induced M. to retreat: he was pursued by the earl and the Gordon Highlanders; and in a battle June 15 at Meagra Hill, near Stonehaven, M. obtained a complete victory. Four days later, he was again master of Aberdeen, after a fierce struggle at the passage of the Dee. The citizens were stricken with alarm, expecting some bloody punishment for their well-known leanings toward prelacy, but M. agreeably disappointed their fears. At a subsequent period, he was upbraided by the Committee of Estates for not having burned the town on this occasion. News of 'the pacification of Berwick' now arrived in Aberdeen, and terminated the struggle in the north. Charles, who was noted for his fascinating power in conversation, invited several of the Covenanting nobles to meet him at Berwick, where he was holding his court, and to consult with him about Scottish affairs. Among those who went was M., and

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from that interview the Scotch Presbyterians dated what they regarded as his apostasy. Be that as it may, his political position was certainly different after his return. In the general assembly which met 1639, Aug. 13, under the presidency of the Earl of Traquair, as royal commissioner, he showed symptoms of disaffection toward the Covenant, and was the object of popular obloquy. One night he is said to have found affixed upon his chamber-door a paper bearing these words, *Invictus armis, verbis vincitur*. The dissolution of the parliament 1640, June, led to an open rupture between the king and the Covenanters, and both parties prepared to decide their quarrel by force of arms. The king assembled at York an army of 21,000 horse and foot; the Covenanters one of 26,000, which, under the command of Leslie, crossed the Tweed 1640, Aug. 21, M. being the first man that forded the stream. The successes of the Scots soon forced Charles to summon a new parliament for settlement of national grievances. Meanwhile M., with several other nobles, had entered into a secret engagement at Cumbernauld, for the purpose of frustrating what they regarded as the factious designs of the extreme Presb. leaders. His conduct in England, too, had been suspicious. It was accidentally discovered that he had been secretly communicating with the king; and when the parliament assembled (1640, Nov.), he was cited to appear before a committee. The affair of the *Cumbernauld Bond*, discovered by the ingenuity of Argyle, was brought up; but M. defended his conduct and that of his colleagues; and nothing came of it, though some fiery spirits among the clergy, says Guthrie, 'pressed that their lives might go for it.' In the following June, M. and some others were accused of plotting against Argyle, and were confined in Edinburgh Castle, where they remained till the beginning of 1642, when they were set at liberty in return for the concessions which Charles had made his Scottish subjects. Although they had been frequently examined, nothing definite had been proved against them. The accusation that M. had offered to the king to assassinate Argyle is not historically substantiated, and is intrinsically improbable. During the next two or three years he kept aloof, outwardly, from public affairs, but he had finally broken with the Covenanters, and had privately ranged himself on the side of the king. Indeed, M. had no natural inclination toward Puritanism, and cared little for the ecclesiastical questions involved in the quarrel. As he had opposed the outrageous intermeddling of the crown with the liberties of Scotchmen in their Presb. worship, so now he opposed the harsh, almost insolent control which the Presb. clergy claimed over the laity. The civil war in England had now broken out, and was being carried on with dubious success. Charles and his advisers resolved to crush the Presb. leaders in Scotland, who were abetting the efforts of the English parliamentarians. In the spring of 1644, M., now raised to the rank of marquis, left Oxford, where he had been residing

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with his sovereign, and proceeded to Scotland to raise the royalists in the north. The battle of Marston Moor for a moment paralyzed him, but his resolution speedily returned. He threw himself into the Highlands, and, after skulking about the hills in disguise, met at Blair-Athol some Irish auxiliaries and a body of Highlanders under Allaster Maccoll Keitache Macdonald, better known as *Colkitto*, who had forced their way thither from the Western Isles in hopes of joining him. M. instantly placed himself at their head, and the clans quickly rallied round his standard. Marching s., he fell suddenly (Sep. 1) on the Covenanting army commanded by Lord Elcho, at Tippermuir, near Perth, and gained a complete victory: not a single royalist was slain. The same night, M. entered Perth, where he remained three days, levying a fine of 9,000 merks on the inhabitants. He then set out for the n., defeated a force of Covenanters under Lord Burleigh at Aberdeen (Sep. 13), and took possession of the city, which was abandoned for four days to all the horrors of war. The approach of Argyle, at the head of 4,000 men, compelled M., whose forces were far inferior in numbers and discipline, to retreat. He plunged into the wilds of Badenoch, recrossed the Grampians, and suddenly appeared in Angus, where he wasted the estates of more than one Covenanting nobleman. Argyle, baffled in his attempts to capture or crush M., returned to Edinburgh, and threw up his commission. His opponent, receiving large accessions from the Highland clans, planned a winter campaign, marched s.w. into the country of the Campbells, devastated it frightfully, drove Argyle himself from his castle at Inverary, and then wheeled north, intending to attack Inverness, where the Covenanters were posted in force under the Earl of Seaforth. The 'Estates' at Edinburgh were greatly alarmed, and, raising a fresh army, placed it under the command of General Baillie, natural son of Sir William Baillie of Lamington. After consulting with Argyle, it was arranged that he should proceed by way of Perth, and take M. in front, while Argyle should rally his great array of vassals, and attack him in the rear. The royalist leader was in the great glen of Albin—the basin of the Caledonian Canal—on his way to Inverness, when he heard that Argyle was following him. He instantly turned on his pursuer, fell upon him unexpectedly at Inverlochy 1645, Feb. 2, and utterly routed his forces: 1,500 of the Campbells were slain, and only four of M.'s men. He then resumed his march northward, but did not venture to assault Inverness—his wild mountaineers being admirably fitted for rapid irregular warfare, but not for the slow work of beleaguering. Directing his course to the e., he passed—with fire and sword—through Elgin and Banff into Aberdeenshire, which suffered a similar fate, captured and pillaged the city of Dundee (Apr. 3), and escaped safely into the Grampians. May 4, he attacked and routed Hurry at Auldearn, near Nairn; and soon again issued from his wilds, and inflicted a still more disas-

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trous defeat on Baillie himself, at Alford, in Aberdeenshire (July 2). There was now nothing to prevent his march s., and about the end of the month he set out with a force of 5,000 to 6,000 men. He was followed by Baillie, who picked up reinforcements on his way, and Aug. 15 again risked a battle at Kilsyth, but was defeated with frightful loss—6,000 of the Covenanters being slain. The cause of Charles was for the moment triumphant; M. was virtually master of the country. The king formally appointed him lieut.gov. of Scotland and commander-in-chief of the royal forces. All the principal cities in the west hastened to proclaim their fidelity, and laid the blame of the recent troubles on the unfortunate Presb. clergy. But affairs soon took a very different turn. Great numbers of the Highlanders returned home—we might even say, deserted—burdened with multifarious plunder; and the Earl of Aboyne withdrew with all his cavalry. M.'s position, in a district teeming with enemies, was growing critical, and Sep. 4 he broke camp at Bothwell, and marched for the eastern counties, where Charles had informed him that the Earls of Traquair, Home, and Roxburgh were ready to join him. In this he was disappointed, and Sep. 13 he was surprised at Philiphaugh, near Selkirk, by David Leslie, who fell upon the relics of M.'s army and his raw levies with 6,000 cavalry—the flower of the Scottish forces then serving in England—who had been hurriedly dispatched home on the news of M.'s startling successes. Leslie completely annihilated his opponent. 'On Philiphaugh,' says Sir W. Scott, 'M. lost the fruit of six splendid victories.' Escaping from the field of battle, he made his way to Athol, and again endeavored, but in vain, to rouse the Highlands; and at last Charles, whose cause now began to decline in the civil war, was induced to order him to withdraw from the kingdom. 1646, Sep. 3, he sailed for Norway, whence he proceeded to Paris. Here he endeavored, but in vain, to induce Henrietta Maria to bestir herself on behalf of her husband. The queen coldly received all his suggestions, and at last M., in despair, betook himself to Germany, in hope of service under the emperor, but soon returned to Holland, and entered into communications with the Prince of Wales, afterward Charles II. It was here that news of the beheading of Charles I. reached him: M. fainted on receipt of the dreadful intelligence, and gave way to the most passionate regrets. Charles II. now re-invested him with the dignity of lieut.gov. of Scotland, and M. undertook a fresh invasion on behalf of the exiled monarch. 1650, March, he arrived at the Orkneys with a small force, and after the lapse of three weeks proceeded to Caithness; but neither the gentlemen nor the commons would rise at his call. He forced his way as far s. as the borders of Ross-shire, where his dispirited troops were attacked and cut to pieces at a place called Corbiesdale, near the pass of Invercarron, by a powerful body of cavalry under Col. Strachan. M. fled into the wilds

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of Assynt, where he was nearly starved to death, when he fell into the hands of M'Leod of Assynt, who delivered him up to Gen. Leslie, by whom he was brought to Edinburgh. Condemned to death as a traitor to the Covenant which he had signed, he was hanged. His demeanor in his last moments was noble and dignified. He declared that he was still a Covenanter; that he did not care for bishops, and had never intended to advance their interests.

MONTSERRAT, *mönt-sër-răt'*: one of the Lesser Antilles, belonging to Britain, 43 m. n.w. of Guadeloupe, and about the same distance from Antigua and St. Kitts. It is about 11 m. in length, 7 in breadth; 32 English sq. m. About two-thirds of the surface is mountainous and barren; the rest is well cultivated. The chief products are sugar, limes, rum, and molasses; but cotton, arrow-root, and tamarinds also are exported. The island forms a portion of the government of the Leeward Isles, and is directly ruled by a president, aided by a council and house of assembly. The chief town is Plymouth, on the s. coast. In 1880 the tonnage of vessels which entered and cleared its port was 13,484; total value of imports £25,364; of exports £29,121. Pop. (1887) 11,000.

MONTSERRAT, *mont-sër-rât'* (Lat. *Mons Serratus*, from having jagged ridges *like the teeth of a saw*): mountain of Catalonia, in n.e. Spain, about 30 m. from Barcelona; height 3,919 ft. 'Its outline,' says Ford (*Handbook for Spain*, I. 419), 'is most fantastic, consisting of cones, pyramids, buttresses, nine-pins, sugar-loaves, which are here jumbled by nature in a sportive mood.' The pious Catalonians aver that it was thus riven and shattered at the Crucifixion. Every rift and gorge is filled with box-trees, ivy, and other evergreens. From the topmost height, the eye wanders over all Catalonia, and from the sea the ridge looks like an immense wall with seven pyramidal peaks. The mountain, however, owes its fame not to its extraordinary appearance, but to the Benedictine Abbey built upon it, at an elevation of 1,200 ft., and to the 13 hermitages formerly perched like eagles' nests on almost inaccessible pinnacles. In 1811 the French, under Suchet, plundered the abbey, burned the library, shot the hermits, and hung the monks (who had given shelter to their emigrant brethren at the Revolution). The place suffered still more 1827, when it became the stronghold of the Carlist insurrection.

MONUMENT, n. *mön'ũ-měnt* [F. *monument*—from L. *monũmen'tum*, a memorial—from *moněō*, I admonish or remind: It. *monumento*]: anything durable made or erected to perpetuate the remembrance of any person or thing; a structure, as a pillar or mausoleum, erected as a memorial; a tomb; any enduring evidence or example, as a *monument* of folly or wisdom. **MON'UMENT'AL**, a. *-měnt'ăl* [F.]: of or relating to a tomb or monument; memorial; preserving memory. **MON'UMENT'ALLY**, ad. *-lĩ*.—**SYN.** of 'monument': cenotaph; memorial; remem-

brance.—See CAIRN : CROMLECH : SEPULCHRAL MOUND : PILLAR : OBELISK : PYRAMID : ARCH, TRIUMPHAL : BRASSES, SEPULCHRAL : TOMB : TOPE : MAUSOLEUM : ETC.

MONZA, *mōn'zâ* (anc. *Modætia*): chief town of a dist. in the province of Milan; on the river Lambro, 10 m. n.n.e. of Milan, with which it is connected by railway. It is essentially a town of Lombard growth, and under the Lombard sovereigns was cap. of their kingdom. It owes much of its early importance, and its chief public edifices, to Theodolinda, the great queen of the Lombard dynasty. In the middle ages, M. was conspicuous for the wealth of its numerous citizens and nobles, and the extent of its cloth-trade. It has undergone 32 sieges. The cathedral, founded in the 6th c. by Theodolinda, contains many interesting memorials of this great queen. The famous Iron Crown (q.v.) and regalia of Lombardy, employed at the coronation of the German emperors as kings of Italy, were removed from Lombardy by the Austrians 1859, on the cession of that province to France. The town has a good gymnasium, a theatre, two hospitals, and a philharmonic institution. Its manufactures of cottons, hats, and preserved meats are increasing. M. is surrounded by an exuberantly fertile district, which yields abundance of grain, fruits, wine, and silk, and possesses great beauty of scenery and climate. Pop. of M. (1881) 17,077.

MOOD, n. *môd* [Dut. *moed*; Ger. *muth*; Iccl. *modr*, spirit, courage]: disposition of mind; temper of mind; a temporary state of the mind; disposition. MOODY, a. *môd'i*, peevish; fretful out of humor; sad; gloomy. MOOD'ILY, ad. *-li*. MOOD'INESS, n. *-nēs*, sullenness; peevishness.—SYN. of 'moody': pensive; capricious; varying; mournful; dejected; melancholy.

MOOD, n. *môd* [F. *mode*, fashion, way, mood in grammar—from L. *modus*, a measure, quantity (see MODE)]: in *gram.*, a certain form of inflection indicating the *mode* or *manner*, as regards action, in which the meaning of the verb is presented to the learner, as indicative *mood*, imperative *mood*; in *logic*, the form of a syllogism, as determined by the quantity and quality of the three propositions by which it is formed; style of music.

MOODIR, or MUDIR, n. *mô'dēr*: Turkish name for the gov. of a city or district.

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MOODY, mō'dī, DWIGHT LYMAN: evangelist: b. 1837, Feb. 5, Northfield, Mass. When only four years of age he lost his father by death. He worked on a farm in summer and attended the country school in winter until he was 17 years old, when he became clerk in a shoe-store owned by an uncle, in Boston. He attended the Mount Vernon Congl. Church and Sunday-school, and became a member of that church 1855. Under many discouragements he worked zealously in the church and Sunday-school. He went 1856 to Chicago, obtained a clerkship, and established a mission Sunday-school, which soon had 1,000 members. He relinquished his clerkship and devoted himself to study and religious work. He served the Christian Commission during the civil war, was then employed as city missionary by the Young Men's Christian Assoc. of Chicago, and subsequently became pres. of that organization. To meet the needs of his numerous converts, most of whom were gathered from classes outside of ordinary religious influences, an independent church was formed of which M., though not ordained, was pastor. In the great fire 1871, the church, with a house which had been presented to M., was destroyed, but a new church accommodating 2,500 persons has taken its place. At a convention of the Young Men's Christian Assoc. 1871, M. met Ira D. Sankey, the famous singer, who joined him in his Chicago enterprise and has since frequently labored with him in evangelistic service. In 1873, June, M. and Sankey commenced a series of meetings in the great cities of England, Scotland, and Ireland, which were attended with remarkable results. They returned 1875 and held meetings in many of the large cities of the United States, at which great numbers of people were converted. They visited Great Britain again 1883, returned the following year, and have continued their labors in the same line with great success. Each summer there is held at Northfield, under the general direction of M., a school for Bible study for college students of this and foreign lands. This term lasts about two weeks, and is followed by a conference, or convocation, of Christian workers from all parts of the world. M. is a close student of the Bible, exceedingly earnest and pungent in his preaching, yet noticeably broad and charitable in spirit. He is deeply versed in the Scriptures, has unfailing tact and knowledge of men, and uses language utterly simple and unambitious, but of singular force, fitness, and impressiveness. Among M.'s writings are *The Second Coming of Christ*, *Secret Power*, *The Way to God*, and *Arrows and Anecdotes*. Several vols. of his sermons have been published. He died 1899, Dec. 22.

NORTHFIELD SEMINARY.—After making (1875) Northfield his permanent home, Mr. M. became impressed with the need of the young people in the vicinity for better educational facilities and a stimulus to more earnest Christian living. In connection with friends he formed the plan of a school for girls which should supply a good English education to those who, from want of means or opportunity to attend, were shut out of existing institu-

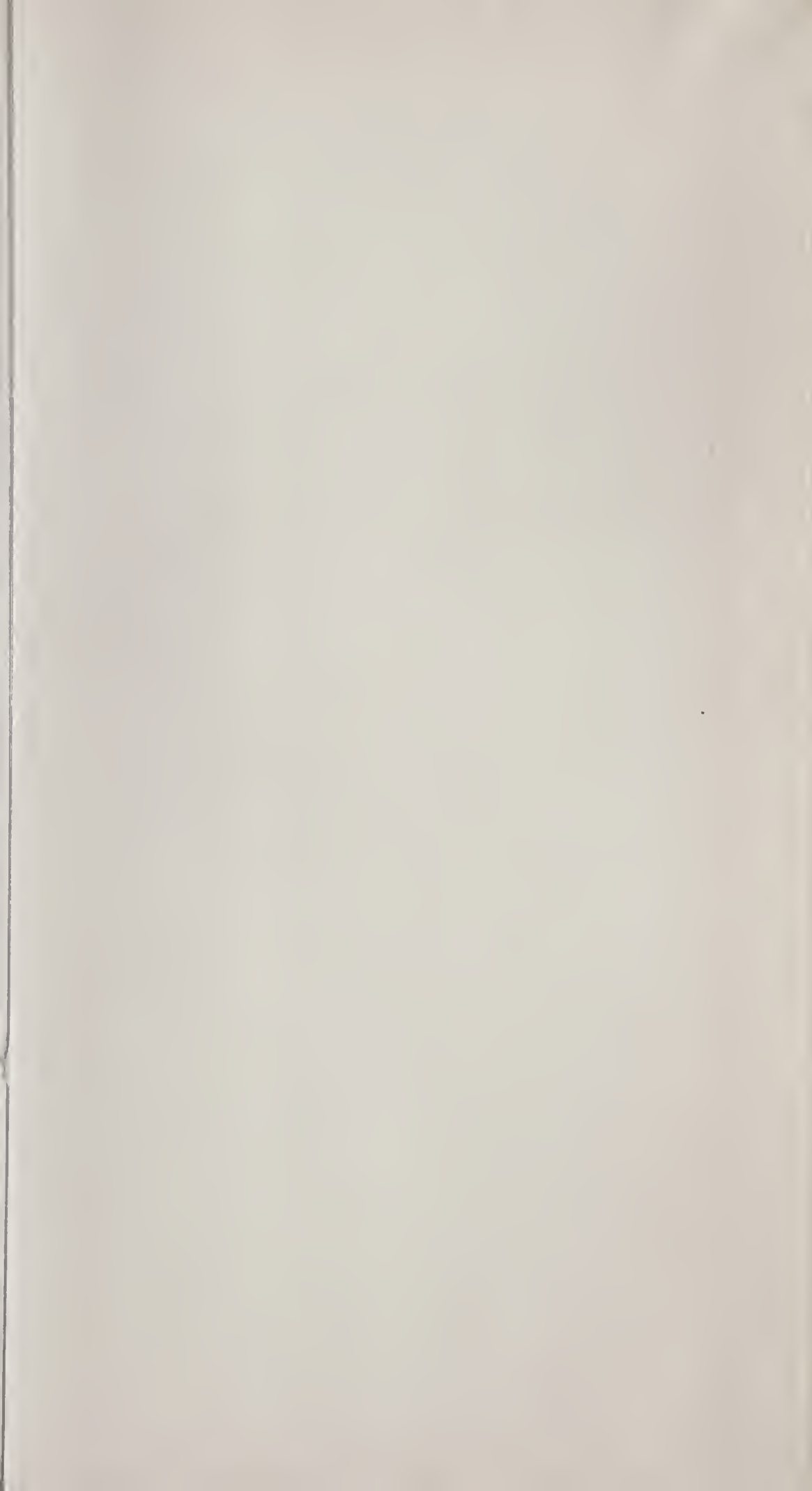
tions, and which should fit its pupils for mission work in large cities or in foreign lands. The English course is designed to be equal to that of a good academy, the Latin to fit for admission to college; and the distinctive aim of the seminary is to develop Christian character. Either course of study covers four years, and one year is required as preparation therefor. A certain amount of domestic work is required of each pupil, partly to reduce the expense of maintaining the school and partly to develop character and fit for usefulness. The expense for board and tuition is \$100 per year for each pupil, and the deficit resulting from this low charge is made up by friends of the institution, the parties owning the royalty on the Gospel Hymn Books being liberal benefactors. A large farm connected with the seminary furnishes part of the food supply. The seminary was opened 1879, Nov. 3, with 25 pupils. In 1889 a class of 16 was graduated, and there were 339 names on the roll for 1889-90. Each year of its existence applicants have been refused for lack of room. The expenses of the seminary 1888 were \$42,976.01; receipts from pupils \$27,581.41; the total endowment \$42,000; and the valuation of the property 1889, \$218,217.05.

MOUNT HERMON SCHOOL FOR BOYS.—Though it was not opened as early, the plans for this school were laid before the Northfield Seminary was organized. While in Chicago, Mr. M. planned a school in which boys might obtain a good education, with thorough training in the Scriptures. The great fire of 1871 delayed the execution of these plans, and the school was finally established at Mount Hermon. This is in the town of Gill, Mass., just s. of the line of Northfield and w. of the Connecticut river. It is about four m. from the seminary. The first purchase of land was made 1879, and by subsequent additions the grounds now comprise about 400 acres. The first boy came to the school 1881, May 4, and the articles of incorporation were signed 1882, Mar. 29. In 1883 12 boys came from Manchester, Eng., as pupils; and new buildings have been frequently required by the increasing number of applicants. There is a preparatory department in which pupils who have had few advantages are fitted for a higher grade, an English, a classical, and a biblical course. The latter has occupied but two years, but it is proposed to extend it to four years, to correspond with the other courses. Industrial education is given not only in the line of various trades, but also on the farm and in the house. Considerable attention is given to vocal and instrumental music. The Bible is made the principal text-book, and the chief aim of the school is to prepare men for religious work and Christian usefulness. The expense to the pupils is \$100 per year for each. Large donations to the school are made by the owners of the copyright of Gospel Hymns, and by other friends. In 1889 there were representatives of 16 nationalities connected with the school, and a class of 12 members was graduated. The expenses for 1888 were \$65,-808.87; receipts from pupils \$20,720.95; endowments

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\$41,119.62; and the valuation of the property 1889, \$245,811.82.

MOODY, SAMUEL: 1676, Jan. 4—1747, Nov. 13; b. Newbury, Mass. He graduated from Harvard College 1697, studied theology, and became pastor 1709 of Congl. Chh. at York, Me. He attended, as chaplain, 1745, the expedition of Sir William Pepperell to Cape Breton. Later he was prominent in establishing a Congl. church, Providence, R. I. He was noted for benevolence, zeal, shrewd wit, and originality of character. Some of his quaint sayings are still in circulation. Among his published works were *The Doleful State of the Damned* and *Judas Hung Up in Chains*. He died York, Me.





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